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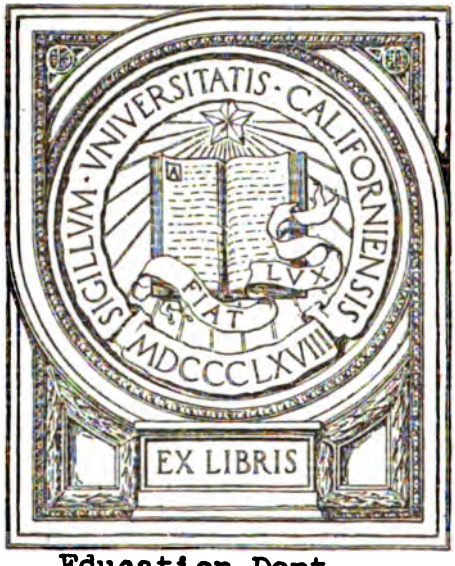
# VOCATIONAL EDUCATION IN EUROPE

COOLEY

IN MEMORIAM
Prof. A.F. Lange

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# VOCATIONAL EDUCATION IN EUROPE

## REPORT TO THE COMMERCIAL CLUB OF CHICAGO

BY
EDWIN G. COOLEY

1912
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CHICAGO

EDUC.

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# FOREWORD

IN 1910, The Commercial Club of Chicago employed Edwin G. Cooley, former Superintendent of Chicago Schools, to make an investigation of the vocational schools of Europe, devoting special attention to the study of German systems. Mr. Cooley spent about a year in Europe, and presents in this report the result of his observations and investigations.

No subject has interested the members of the Club more than practical education. They founded, and for many years supported, the Chicago Manual Training School at Twelfth Street and Michigan Avenue; they raised endowment funds for the Illinois Manual Training School at Glenwood and the St. Charles School for Boys; they presented the United States Government the site for the Naval Training School at Lake Bluff; for many years they contributed to the support of classes in practical subjects in the evening schools of Chicago.

It is the hope of the Club that through the investigations recorded in Mr. Cooley's report, some assistance will be afforded to the movement for supplying more direct and more practical schools for the betterment of our youth—especially taking into consideration those who are compelled at fourteen years of age to undertake the burden of self-support. While the Club is interested in all forms of practical education, it is particularly interested in the boy and girl of fourteen who must become wage earners before they have attained their full physical, mental and moral development. They believe that no problem is of greater importance at the present day, and submit this report as a contribution to its solution.

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# PREFACE

THIS report undertakes to describe some of the typical vocational schools observed by the author during his year in Europe. The major part of the report is devoted to the educational institutions of Germany. Some special institutions in Austria and Switzerland are described on account of their relations to the general problem of vocational education. The report does not profess to be a complete study of the industrial schools of Germany, but merely a sketch, with some mention of such institutions as seem to be of interest to students of the problem in America. The author has not attempted to write a criticism of German institutions, but merely to record experiences and observations that seem likely to be helpful. It would be easy to select schools and courses in Europe that could be justly criticized from an American point of view, but such criticisms would be of little or no value to the American student.

The author has not included in this volume three articles he has written for the Vocational Magazine on The Continuation Schools of Crefeld, The Pre-Apprentice Schools of London, and The Continuation Schools of Edinburgh. They will be appended to the report of the Educational Committee of the Commercial Club of Chicago, printed in a separate volume.

The author wishes to thank the members of the Commercial Club for the generous support they have given to this investigation; in this, the Club has only followed its usual policy of backing up every enterprise that seemed likely to be for the benefit of the general public.

The author begs the indulgence of the reader with regard to errors which will undoubtedly be found in this report, and invites suggestions and criticisms.

EDWIN G. COOLEY.

March 27, 1912.

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The author also wishes to include directors and teachers in the various industrial schools visited. They were uniformly courteous and helpful.

His thanks are also due Dr. Kerschensteiner of Munich and Dr. Heinrich Back of Frankfort for the fine collection of drawings and school material presented by them to the Commercial Club of Chicago.

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# TABLE OF CONTENTS


| | | |
|---|---|---|
| I. | General Introduction | 11 |
| II. | Survey of Vocational Education in Germany | 31 |
| III. | Industrial Evolution and Apprenticeship | 56 |
| IV. | Outline of the School System of Germany | 74 |
| V. | Continuation Schools | 78 |
| VI. | Vocational Guidance | 130 |
| VII. | Secondary Technical Schools | 138 |
| VIII. | Building-Trades Schools | 141 |
| IX. | Machine-Trades Schools | 147 |
| X. | Art-Trades Schools | 153 |
| XI. | Textile Schools | 165 |
| XII. | Technical Schools for Woodworkers | 168 |
| XIII. | Technical Universities | 172 |
| XIV. | Training of Independent Handicraftsmen | 176 |
| XV. | Commercial Schools | 200 |
| XVI. | Industrial Schools for Girls | 218 |
| XVII. | Training of Vocational Teachers in Germany | 229 |
| XVIII. | Agricultural Schools | 271 |
| XIX. | Industrial Education in Austria | 276 |
| XX. | Commercial Education in Austria | 306 |
| XXI. | Industrial Education in Switzerland | 314 |
| XXII. | Conclusion | 329 |

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## CHAPTER I

# GENERAL INTRODUCTION

"WE have conquered upon the field of battle in war; we are now conquering upon the field of battle in commerce and industry." Such was the watchword which Crown Prince Friedrich gave to Germany at the inauguration of the Museum for Industrial Art in Berlin the day after the treaty of Frankfort, closing the Franco-Prussian war. Since 1871, the struggle for commercial supremacy has succeeded the struggle for military supremacy, or perhaps one might say: Germany's military supremacy has become but a means to her deeper purpose of commercial and industrial leadership.[1]

After the consolidation of the results of the Franco-Prussian War, Bismarck, then all-powerful, undertook the direction of the Ministry of Commerce and Industry. In a little while, everything was transformed, almost created anew. He provided for everything, and some years later one saw with astonishment the mills and factories of Germany enter upon a period of feverish activity, while at the same time German engineers and chemists revealed themselves to the world by a series of remarkable discoveries in the applications of science to industry.

The development of technical education has not been the only cause for Germany's progress. Other factors have contributed; the multiplication of railways; the opening up of the German ports, making communication with the interior of the country easier; the improvement of the canals and rivers; the encouragement given to the merchant marine; the reduction in the cost of transportation; the better utilization of their natural resources; the legislation protecting and stimulating industrial enterprise. The German

[1] From Astier et Cuminal's L'Enseignement Technique.

technical schools, however, have taken a principal part in the marvelous extension of that country. These schools have called out improvements of all sorts, answering to the needs of the public, and have made it possible for those other agencies to operate successfully. It may be hard to separate cause from effect in this matter. It seems clear, however, that there is a close connection between the enormous development of Germany's application of science and art to industry, and her astonishing industrial and commercial prosperity.

Mr. Dawson, in his book, "Evolution of Modern Germany," sketches the remarkable changes that have taken place in Germany since the Franco-Prussian War, including the development of the German cities, the changes in occupations of the inhabitants, and the growth of special industries.

"In 1871, Germany had eight large towns of over 100,000 inhabitants; in 1880, the number was fourteen; in 1890, there were twenty-six such towns, yet only seven whose population exceeded a quarter of a million; in 1895, the number of large towns had increased to thirty; in 1900, it was thirty-three, and, in 1905, there were forty-one towns of over 100,000 inhabitants, of which eleven had over 250,000 inhabitants, and five had over a half-million. The entire town population in Germany in 1871 was 23.7 per cent of the whole; in 1900, 42.26 per cent.

"The occupation censuses of 1882 and 1895 furnish further significant evidence of the economic transition through which Germany is passing. It was estimated that in 1843 the population engaged in agriculture, forestry, gardening, and fishing (one of the census units) formed 61 per cent of all the persons earning a livelihood. When the first great occupation census was taken in 1882 it was found that the proportion had fallen to 43.4 per cent and that at the next occupation census of 1895 there was a further decline to 37.5 per cent. The percentage of the entire German population actually dependent upon agriculture, forestry, gardening, and fishing declined between 1882 and

1895 from 42.5 per cent to 35.7 per cent. On the other hand, the occupation census of 1882 shows that 33.7 per cent of all persons earning a livelihood were engaged in industry and mining, and that of 1895 shows a percentage of 37.4 per cent, while during the same period the percentage engaged in trade and transportation increased from 8.3 per cent to 10.6 per cent. Thus, while between these two enumerations the share of agriculture in the earning section of the population decreased by 5.9 per cent of the whole, the share of industry increased by 3.7 per cent, and that of industry and commerce together by 6 per cent.

"Even numerically, in spite of the growth of population, agriculture, forestry, gardening, and fishing have only just maintained their position. In 1882, agriculture, forestry, gardening and fishing employed 8,236,496 persons in the whole of Germany; in 1895, 8,292,692, an increase of 56,206 persons, or .7 per cent. During the same period the number of persons employed in industry and mining increased from 6,396,465 to 8,281,220, an increase of 1,884,755, or 28.5 per cent, and those engaged in trade and transportation increased from 1,570,318 to 2,338,511, an increase of 768,193, equal to 48.9 per cent.

"An examination of Germany's output in special branches of production during the last thirty or forty years will help us to realize the changes taking place there. In Prussia, the coal industry has multiplied sixfold during the past forty years. The coal syndicate estimated in 1905 that about 70 per cent of its total output in coal was used directly for industrial purposes. While Germany still imports some 9,000,000 tons of coal, she exports twice this amount. The output of iron ore is four times as great as it was thirty years ago. The number of persons employed in the iron and steel industries and manufactories of these metals has increased between 1875 and 1895 from 732,382 to 1,114,506.

"In 1882, Great Britain was first in the production of pig iron for the world, the United States second, and Germany third. In 1909, the United States was first, Germany

second, and England third. The larger part of this increased production has been needed for home consumption. Thirty years ago German production of steel was barely half a million tons a year. It now exceeds twelve million tons.

"Germany's growth in the electrical and chemical trades is even more remarkable. The number of electrical works in 1904 in Germany was 1,028. One electrical company had a capital of $25,000,000, with loans and reserves of $20,000,000, and with 34,000 employees. In 1903 there were over 150,000 work people employed in the chemical industries of Germany."

Another writer, Mr. Barker, adds that:

"Four-fifths of the dyes consumed in the world are made in Germany. Her chemists are replacing indigo with indigotin, vanilla with vanillin, camphor with synthetic camphor, madder with alizarin, etc. In 1848, the output of Germany in raw sugar was 12,500 tons. In 1905 and 1906, there were in operation 425 manufactories and refineries, whose entire production of raw sugar was 2,400,770 tons. The German chemists in twenty years have more than doubled the percentage of sugar obtained from beets."

Mr. Dawson goes on to say:

"Every year manufactured goods form a larger proportion of Germany's exports and a smaller proportion of her imports. In 1905, 46.5 per cent in value of the imports consisted of raw materials for industrial purposes, comparing with 42.5 per cent in 1895. The imports of manufactured goods formed 17.9 per cent of the whole in 1905, as against 21.8 per cent in 1895. Food, luxuries, and cattle represent 31.5 per cent of the imports of 1905, as against 32.7 per cent in 1895. Of the exports in 1905, 24 per cent consisted of raw materials for industrial purposes, as against 21.1 per cent in 1895. Manufactured goods formed 63.7 per cent of the total exports in 1895, and 64.5 per cent in 1905, and the proportion that fell to food, luxuries, and cattle declined from 12.4 per cent in 1895 to 8.7 per cent in 1905. In 1874, Germany's share in the mercantile ma-

rine of the world was 5.2 per cent; in 1894, it was 6.5 per cent; in 1905, it was 9.9 per cent."

According to Mr. Barker's recent book on Germany:

"Until a few decades ago, Prusso-Germany possessed no navy. In 1848 a navy was started, largely by private subscriptions. In 1852, four years later, it was sold by public auction. In 1849, the Prussian navy consisted of two gunboats and twenty-seven row boats, with sixty-seven guns, thirty-seven officers, and 1,521 men. The commander was a Dutchman. In 1857, when the North German Lloyd Steamship Company was established in Bremen, it began its work with a steamship bought in Scotland. A few years ago, M. Lockroy, Minister of the Marine in France, stated that the German fleet was the best organized in the world, and could hold its own against any navy except England. In 1906, Sir Charles Maclaren, M. P., presiding at the yearly meeting of Palmer's Shipbuilding and Iron Company, held at Newcastle, said that Germany was building a greater tonnage than all other continental countries put together."

Mr. Barker North, President of the British Association of Teachers in Technical Institutions, makes the following statement of the changes in the chemical trades of England and Germany:

"In 1907, the gross value of the output of the chemical trade in the United Kingdom was 23½ millions sterling, and of this amount a little over one-third of a million represents the total value of the coal tar dyestuffs. Germany, in 1909, produced aniline colors alone equal to fifteen millions sterling in value, approximately two-thirds of the whole of our chemical trade. The imports of coal tar dyes into England in 1909 increased by sixteen per cent, and in 1910 by ten per cent. The irony of the whole situation is that we celebrated, a few years ago, the jubilee of Perkins' epoch-making discovery of the first aniline dyestuff.

"Ten years ago, practically all the indigo put on the market was of natural origin and supplied by British possessions, but certain German firms set out to capture the

indigo market by the production of artificial indigo. In spite of the statement that the natural product possesses certain intrinsic valuable properties not possessed by the artificial variety, and despite the attempts of the English Government to bolster up the Indian indigo trade, in ten years the annual value of indigo imported into this country from India has fallen from a million sterling to less than 150,000 pounds. Germany, in 1909, exported to Asia alone, the home of the natural indigo, indigotin to the value of 1,900,000 pounds. This, again, is now being followed up by the production of vat dyes, many of them products derived from artificial indigo. These colors being extremely fast, in many cases even to bleaching agents, may yet revolutionize our cotton-dyeing industry. We have not only lost our indigo trade, but in these developments our color manufacturers are again allowing the German firms to forge ahead.

"This forward movement is not confined to the color trade alone, for the adoption of new processes of manufacture often reacts advantageously on older processes, creating an increasing demand for other products, notably in the heavy chemical trade. At one time, Lancashire produced practically all the sulphuric acid of the world; some ten years ago about one million tons were said to be manufactured annually, principally in this part of the country, whereas, according to the recent census, the total amount manufactured in the United Kingdom in 1907 was 473,000 tons. This was largely due to the commercial development, in Germany and other countries, of the 'contact process' for the manufacture of sulphuric acid, the initiation of which is principally due to the demands created by the dyestuff industries. It is again interesting to note that the first patent for this process was taken out by Dr. Squires, an English chemist, though the process has been converted into a commercial success in other countries."

Mr. North concludes:

"This is typical of the advancement and development which has been such a marked feature of the chemical trade

of other countries. Examples might be multiplied to prove that in England we are engaged to a large extent in tinkering up the old processes of manufacture, while other countries avail themselves of new lines of thought and experiment. The great German industrial cohferns, knowing the value of the scientific expert, will oncn wait for years for the final results of researches which ttey realize may ultimately revolutionize an industry, or may provide entirely new industries.

"Germany has developed a scheme of practical education of the masses, which will provide her industries with an army of well-trained workers, and at the same time she has developed to the highest pitch the scientific training of original technologists. It may be that we require more Dreadnoughts, but no number of battleships will prevent our being left far behind in the race of industrial progress, if we continue to rest self-satisfied on the laurels of the past."

Mr. Dawson claims that industrial Germany is largely the child of industrial England. It was Englishmen, he urges, who first took hold of the construction of railways, gas works, tramways, and machine shops in Germany. In 1838, Mr. Richard Cobden foretold the day when the weapons which English enterprise and example were then placing in German hands would be turned against themselves with fatal effect. Those were the days of Germany's apprenticeship. Since completing this apprenticeship, Germany has been doing business on her own account and appears to be outstripping her master. Germany has proceeded to supply other nations, and England has lost control of markets which she had held almost undisputed for generations. What Englishmen are trying to find out today is: "How has this been done?" Mr. Dawson's conclusions are:

"1. The Germans work harder for a longer number of hours a day than the Englishmen.

"2. The Germans regard commerce and industry as a science and an art, while the Englishmen treat it as purely

a matter of rule-of-thumb; the German is attempting to apply trained intelligence to the practical affairs of life.

"3. The German standard of living is less pretentious than the English; the German manufacturer is contented with less profit than would satisfy an Englishman, and pays smaller salaries and wages."

(He admits, however, that the German workmen enjoy substantial compensations for their low scale of wages in the three great insurance benefits—sickness, accident, and old age. It might be added also that low wages and long hours are on the wane in Germany.)

"4. The best of German industrialists avail themselves more fully of modern improvements than they do in England; e. g., in 1905, there were fifty fewer blast furnaces in Germany than in Great Britain, yet Germany was able to produce no less than 2,000,000 tons more of pig iron than Great Britain.

"The German technical schools for the engineering trades have created a science of heating. In their beginning, the German textile and engineering industries and even the chemical industry, in which Germany especially excels, all owed at least as much to foreign ideas and influence as to national talent. The loss of industry from England's neglect to recognize the commercial value of chemistry is incalculable, and can never be made good. The German chemical industry owes its expansion and prosperity to science and scientific methods. It is estimated that in the chemical manufactories of Germany there is an average of a university-trained chemist to every forty work-people. The large manufactories have well equipped laboratories for scientific research. Nowhere is the alliance between science and practice so intimate as in Germany.

"Another secret of Germany's success is that of the study of the needs and wishes of their customers. They recognize that the buyer has a right to have what he wants if it can be made, and that it is a manufacturer's business to supply it. It is impossible to say how much trade has left England owing to obstinate refusal to recognize this not

unreasonable principle. Both German and English writers ascribe a part of Germany's success in foreign and domestic commerce to the training given the German business man in the commercial schools. These business men can speak the language of the customer, and they understand the goods they handle and the needs of their customers.

"The larger technical agencies apart, however, invaluable results are often achieved in Germany by the simplest and most inexpensive means — by the humble village class conducted in the winter evening hours by the light of the oil lamp in the low-roofed schoolroom; by the traveling exhibition of samples of skilled handicrafts which sets provincial ambitions aglow; by the itinerant teacher, who carries a vitalizing store of rudimentary technical knowledge from hamlet to hamlet and from farmhouse to farmhouse in the sequestered mountain districts where home industry is the main support of the population during half of the year. For the most impressive fact about technical education as developed in Germany is its comprehensiveness; it is supplied to every occupation in which it is better for a workman to have it than to be without it.

"With this change there has been a striking growth in the concentration of capital and the multiplication of large undertakings. Germany, however, has not yet entirely gone over to the factory system of production. The handicrafts contend tenaciously with the oncoming tide of capitalism; the house industries still employ about a half-million workers of both sexes, not succeeding very well except in centers like Solingen and Remscheid, where the supply of electrical power by the municipal authorities and private companies and the establishment of Government schools have given a new lease of life to hundreds of independent families and individual workshops, which otherwise would have disappeared long ago. The same thing applies in a lesser degree to the home weaving in Crefeld and Elberfeld districts and to cotton weaving in some of the rural districts of Saxony.

"In Prussia in 1861 there were 28.9 per cent independent

handicraftsmen to every thousand of the population. In 1895, the ratio was 26.7 per cent; now it is about 18 per cent, some of the handicrafts being as good as dead. The State, by means of technical education and other forms of support, is striving to postpone the extinction of the handicrafts. The rural house industries are also making a resolute stand and striving to avert extinction by the factories. The State endeavors to assist them by every means in its power — by offering technical instruction of a kind suited to each locality, both by schools and traveling teachers and by liberal grants of money in special times of misfortune. In Bavaria, traveling teachers are supplied by the State whose duty it is to go from place to place in the rural districts where hand weaving is still a staple industry, supervising the work done, advising as to new designs, and imparting instruction to beginners. The teacher, too, negotiates between weavers and dealers of the town who purchase the goods, thus assisting in the commercial end of the enterprise."

It is admitted that Germany, with poorer land, with a more unfavorable climate and situation, with poorer iron and coal mines, with originally less ingenious and efficient machinery and business methods, is now crowding her competitors to the wall, by employing better trained men. Mr. Barker says that:

"It cannot be doubted that under equal conditions the competition of German manufactured goods with English manufactured goods would be impossible anywhere outside of Germany, owing to the unfavorable geographical position of Germany's coal-fields and industrial centers. Germany is competing largely on account of her system of industrial education."

The opinions just quoted from Frenchmen and Englishmen express the conviction that Germany has deliberately set about the industrial conquest of the world. Mr. Dawson says:

"Germany is devoting her undivided strength to a struggle for sheer mastery in the realm of matter and for political ascendency among the nations. In the struggle with natural forces which has been carried on with such

wonderful perseverance and deserved success; in the strengthening of the Imperialistic spirit; in the irresistible advance of industry and commerce; in the striving after an inviolable military power; in the eager and jealous glances which are now turned toward the sea; in all these things the underlying thought is the thought of *subdual;* and subdual is the spirit of modern Germany, now in the first blush of a new life; its capacity still but partially developed; its resources but partially discovered."

While one cannot resist the conclusion drawn as to what is happening, it is possible to ascribe somewhat different motives for the course pursued by Germany in recent years, motives which show a broader conception of Germany's necessities, and a less materialistic and brutal method. Many German thinkers, while admitting Germany's aggressive policy in industrial and commercial matters, give a broader and a better reason than mere desire for the subjugation of others. They point to self-preservation as the fundamental fact in Germany's policy, both in military and in industrial matters. They urge that by the Austrian and Franco-Prussian wars Germany attained political unity, the unity required by her position, surrounded as she was by enemies who for centuries had profited by her dissensions. She has forged to the front on account of this until she is now perhaps the foremost nation of Europe. She has not, however, attained internal unity. She is divided into hostile factions on internal questions, and has her problems with the Poles, the clericals, and the social democrats. This lack of internal unity has not, up to the present time, prevented all parties from dropping all differences in times of national danger, as was shown recently in her trouble with France and England. It is a question, however, whether she can continue to present a solid front against external dangers unless she succeeds in softening the animosities now dividing her people into warring classes and parties.

The nineteenth century was the century of the rebirth of the Fatherland. The problem which presented itself to German leaders was the creation of a true national spirit

based upon ideals common to the entire people. The outer breakdown of the State presented itself to them as a result of its inner incompetence. They recognized the real cause in the lack of self-activity in the people produced by the old system of government. According to the doctrine sanctioned by absolutism, the State is not an affair of the people, but of the dynasty and of the public officials employed in its service. The duty of the subject is to obey, to pay taxes, and to furnish human material for the army. The effect of this system is a spirit of pure passivity. The subject did nothing which he was not obliged to do; public spirit died; the spirit of indolence and selfishness grew ever greater. Whenever the motive power at the head of the State relaxed, the whole stood still like a dead mechanism; a push from the outside and it broke into pieces.

A revival of the down-trodden State could take place only through the development of the powers dormant in the people. The new State must be based upon the self-activity of all its members, if it was to become a living organism with the powers of resistance and readjustment peculiar to a living organism. Freedom for the individual within his circle was the first requirement; a freedom given by loosening the bonds with which the old State had limited his rights to personal freedom, and freedom of industry and property. Then as a citizen of the new State he must be permitted to participate in the control of the public business of the community, district, and State, not only as a matter of right, but as a means of educating him into power and insight into public affairs.

It has been said above that the nineteenth century was the century of the rebirth of Germany. While Germany has secured outer unity, she still lacks the only adequate guaranty of the permanence of this State unity — the unity of the people themselves. To produce this unity of the people is the problem of the twentieth century. This can be solved by the binding together of all the members of German society into a complete national personality

achieved by a system of education that is national and based on broad principles.

A new education was necessary for a State founded upon these new principles, an education based upon the principles of self-activity and self-responsibility, a training for the head, the hand, and the heart. This new education must not be mere leisure-class education—education for leaders and for professional men—but must be a broad system, taking into consideration the needs of all the individuals in the State.

With the formation of the new political relations of Germany came a great economical development of the young Empire. One aspect of her present problem, then, was economic. She must succeed as a commercial nation, and must solve the questions of production and distribution. Her technical schools are a most important factor in solving these problems, including her great technical colleges, her technical middle schools, and her industrial continuation schools, but if she is not to fail in her larger problem of internal unity, this industrial school system must keep uppermost training for citizenship, using the economic motive as a point of attack. Those familiar with Dr. Kerschensteiner's book on "Education for Citizenship" know how thoroughly he appreciates this fact. Mere technical training will lead to national selfishness, and not to true patriotism. Germany must, therefore, educate the man and the citizen as well as the workman. One will fail to catch the full significance of the German continuation school unless he keeps this in mind.

The principle of economic utility demanded recognition in the new system of schools; both utility and culture must be included in the general schools for the people. Both aims—the cultural and the useful—have their justification; each taken by itself is one-sided, and inadequate to meet the demands made upon the modern citizen.

The German has, therefore, reorganized his entire system of educational institutions with a view to developing all his powers, not only for the struggle between individuals

in the German state, but in his struggle for supremacy in the industrial and commercial fields of the world. It was, then, not merely the motive of *subdual* that led to this movement, but self-preservation, as in matters of this sort there is no such thing as standing still. Germany was compelled to move on to new conquests after the completion of the war with France, and she made use of German thoroughness in her campaign for industrial supremacy.

There are only four great manufacturing nations in the world: France, England, Germany, and the United States. In volume of products, the United States is far in the lead. According to H. E. Miles, Chairman of the Educational Committee of the National Manufacturers' Association:

| | |
|---|---|
| The total production of mine, soil, and factory in the United States is of the yearly value of | $26,000,000,000 |
| The production of manufactures only is about | 15,000,000,000 |
| Of this $15,000,000,000 of manufactures we exported in the year 1907–08 a total of | 1,082,000,000 |
| Of this $1,082,000,000, the greater part, or 63 per cent, consisted of crude and semi-crude materials to the total of | 680,000,000 |
| There is left as our exports of more highly finished manufactured products | 402,000,000 |

This is only one-sixtieth of our total production, and about one-fortieth of our manufactured product.

These semi-crude materials included the following:

| | |
|---|---|
| Foodstuffs partly or wholly manufactured, flour, etc | $331,968,382 |
| Manufactures of copper in bars, wire, etc | 104,064,580 |
| Manufactures of iron and steel, like bars, billets, and rails | 48,118,682 |
| Petroleum and other mineral oils | 97,651,326 |
| Crude manufactures of wood | 62,706,194 |
| Crude manufactures of leather, furs, and furskins | 34,682,482 |

Mr. Miles continues:

"We are not in the race. As a people we are ignorant of foreign trade. Lost in the by-places of England, I have learned more of world trade from notices on the walls of little postoffices than I could from the officials of some of our largest cities.

"It has been aptly said that America is little else than a huge stevedore, bearing down to the ships of the sea crude and semi-crude materials for the employment of the capital, labor, and intellect of foreign nations. Exportation of these partly manufactured materials is a depletion of our natural resources, the heritage of the ages in mine, forest, and soil fertility, never to be restored. Those who are best informed see within a period, which to the far-sighted is only as a day, our wonderful country importing these same materials, and our producers handicapped by excessive cost.

"We have been proud of our great agricultural exportations, but our scientists now give us reason to question to what extent even these exportations have permanently enriched us. We are told that every bushel of wheat exported carries 27 cents worth of phosphorus, every bushel of corn 13 cents, and each pound of cotton 8 cents. These figures fairly represent the supposed profits. To-day our best agricultural states, even those only fifty years under cultivation, yield only half as much per acre as the thousand-year-old soils of Europe. We have been capitalizing soil values to an extreme and hurtful extent, where we thought we were making real and substantial profits. There were reasons in the past for these exportations of various raw and semi-crude products, and we have, on the whole, splendidly prospered; but those reasons are no longer effective.

"Now, we must use every effort to send our products abroad ready for consumption, carrying the maximum and not the minimum of American labor and skill. Think of the difference in the amount of labor carried by a typewriter and a bar of iron; a planer and a billet. We ship our cotton abroad raw at 14 cents per pound. We buy some of it back in fine handkerchiefs from the thrifty Swiss, at

$40.00 per pound, all labor. The exports of England, Germany, and France are finished products, mostly labor; most of ours carry only enough labor to make them fit for ship's cargo.

"Our labor is in many respects the most efficient in the world. We are proud of our 'men behind the guns'; their brothers, *the men behind the machines* in our factories, have no less of ability and the courage of accomplishment. There is brains in a Remington typewriter, in a Singer sewing-machine, and in American shoes. These are already exported in volume, and point the way for tens of thousands of other products, which can be made as welcome in foreign markets. These show, too, that high-paid American wages are cheap wages.

"As then-President Roosevelt said to the writer three years ago: 'We have become an industrial nation, and must acquire world markets for our finished products.' Such markets broaden the industrial base of operations, and will infinitely lessen the hurt of domestic stringencies and panics, which in the world sense are often local."

It is evident from Mr. Miles' figures how far we are from Roosevelt's ideal. We are producing goods because we can produce cheaply; because we can capitalize our national resources rather than make profits; we are producing goods we can sell to the world because we have cheap raw material and ingenious labor-saving machinery, and our business men have capacity for organization. The cheap raw material, however, is becoming constantly dearer; Germany and other nations are modeling their machinery after ours, and are studying our methods of organization. There is a general admission that the market for American machinery in Germany is falling away, and that the Germans are providing their own machinery. By the development of special skill among her workmen, Germany is making up her lack of national advantages. She began the problem of conservation of her national and human resources many years ago.

Conservation of our national resources has attracted

the attention of the public for the last two or three years. We recognize that we have been wasting our national resources, but not so clearly that we have wasted our human resources. We are making attempts to preserve our forests, our mines, our fisheries, and our water power, but are only beginning to appreciate the conservation of our human resources. Professor Carver of Harvard University puts the case in this way:

"In the present conservation movement it is highly important that we realize two things:

1. That our most valuable resources are our people; and
2. That we are wasting people more than we are wasting anything else.

"If we forget either of these things, we shall probably find ourselves trying to save at the spigot while we are wasting at the bung-hole.

"That our most valuable resources are our people may be inferred from certain large facts of economics. Communities have grown rich in the midst of poor geographical surroundings by reason of the simple fact that they have developed the latent energy of their people and applied this energy intelligently. Scotland and New England are conspicuous examples of this kind of success. These communities have, in the past at any rate, developed their human resources and directed them more intelligently than most other communities. Modern Germany may also be mentioned because — though not poor in geographical resources — it has only been since she began training her producers in a superior way that she has risen to pre-eminence as an industrial nation. Other nations have grown poor in the midst of rich geographical resources by reason of the simple fact that they have wasted their people, not simply in war, but by allowing their latent energy to remain undeveloped, or to be unintelligently utilized. Speaking generally, one is safe in saying that no nation ever did prosper as compared with other nations except by reason of its superior conservation of the human factor in production. In view of these large facts, it is reasonably safe to say that

the most destructive form of waste is the waste of labor-power.

"If one will look carefully about he will see, in any community, so many ways in which labor-power is being wasted as to convince him that here is the greatest of all forms of national waste, though it is much greater in some communities than in others. One will find, for example, four characteristic forms of waste labor-power, all of them of considerable magnitude. There are:

1. The army of the unemployed, or the involuntary idle.
2. The imperfectly employed, or the untrained.
3. The improperly employed, the acquisitively rather than productively employed.
4. The voluntary idle, commonly known as 'the leisure class.'

"The industrial school deals directly with the waste due to the imperfect employment of labor on account of the lack of training, and indirectly with the waste due to involuntary idleness. Professor Carver's convincing analysis is familiar. If by means of training "you can transfer unskilled labor into the scarcer and more needed work of management, you provide a demand for the army of unemployed and increase the productive power of the community. Upon the redistribution of labor-power upward from the unskilled and over-crowded occupation toward and into remunerative occupation depends, more than anything else, the expansion of our industries. It takes no miracle to see this; it requires only education."

Germany has shown us the way, and Scotland is following after. They are the two countries of the world that really believe in education as a factor in human efficiency and human happiness. The Englishman of to-day complains, not only of the competition of the Germans, but also of the competition of the Scotchmen. They are both dangerous competitors for him, and for the same reason: they carry on commerce and industry as a science and an art and not by rule-of-thumb; they both have made provision for training their workmen.

It seems natural for the student of industrial education to turn to Germany. There, such educational institutions have made greater progress and have been more successful in the attempts to apply science to industry than those of any other country. In no country will you find the problem taken up in so thoroughgoing a manner; in no country will you find an attempt made to cover, by means of industrial schools, the occupations of everyone from the lowly laborer to the director of the great manufacturing establishment. As has been stated: "The State provides industrial training for every person who will be better off with it than without it. No occupation is too humble to receive the attention of the German authorities; and the opinion prevails there that science and art have a place in every occupation known to man."

Dr. Reynolds, Director of the Manchester Institute of Technology, said in his address to the Imperial Educational Conference last summer: "Whether we are tired of Germany as a model or not, she is too formidable an antagonist in the sphere of world-politics, in the domain of high learning, in the field of manufacturing industry, and in the world's market, for us to ignore her rapid advance, or to be indifferent as to the cause.

"Within a generation of living men her sun has risen above the horizon, and has blazoned forth, as it is rising towards the zenith, with a splendour that compels our admiration, even though it may fill us with alarm.

"It is hardly more than a hundred years ago since Prussia lay 'a bleeding and lacerated mass' under the heel of Napoleon, but she fortunately had men with long vision and keen insight as to the true principles by which the nation should ultimately find salvation, and they founded the University of Berlin, now with 13,827 students, 'to supply the loss of territory by intellectual effort.'

"In short, it was to education, thorough and far-reaching, that these wise counsellors looked for the means whereby their nation should regain and enhance its position in Europe and the world, and the faith and hope which inspired them has, as we all know only too well, been more than justified.

"In no other way can the phenomenal advance of the German nation be explained, and the evidence of this advance is seen in her enormous output of fine chemicals, which has enabled her to put the whole world under toll, in her great mechanical and electrical engineering developments, and in her mercantile marine."

The lines of William Watson, in his "Coronation Ode" of 1902, are instinct with prophecy:

"Time and the Ocean and some fostering star
In high cabal have made us what we are.

. . . . . .

But now the day is unto them that know
And not henceforth she stumbles on the prize;
And yonder march the nations full of eyes.
Already is doom a-spinning, if unstirred
In leisure of ancient pathways she lose touch
Of the hour, and overmuch
Recline upon achievement, and be slow
To take the world arriving, and forget
How perilous are the stature and the port that so
Invite the arrows, how unslumbering all
The hates that watch and crawl."

CONTINUATION SCHOOL FOR COOPERS, MUNICH

CHAPTER II

# SURVEY OF VOCATIONAL EDUCATION IN GERMANY

## INDUSTRIAL TECHNICAL EDUCATION

INDUSTRIAL technical education in Germany is not carried on under imperial laws. According to article four of the imperial constitution, the regulation of industries is within the jurisdiction of the German Empire. It is only so far as this regulation of industries touches upon technical education that imperial legislation controls. At the present time there are three points of contact:

1. The trade regulations of the Empire, prescribing the qualifications of persons who wish to carry on some particular industry.

2. The laws prescribing the powers and duties of the guilds.

3. The laws requiring young workers to attend a continuation school where such schools exist.

These three points are governed by imperial legislation. The laws of the individual states control in all other matters which concern industrial education. In consequence of this the technical school systems in the various states of the Empire have developed each in its own way, both as to substance and as to form of education. There are certain points of resemblance, but in most particulars so extraordinary a variety is presented that to give a complete account involves a separate analysis of the conditions in each individual state of the German Empire. A description of the German system of industrial education must, therefore, consist chiefly of a series of outlines of what is being done in

the various states. One can point out only a few general principles that govern everywhere.

In Germany the doctrine is firmly established that the maintenance of a complete system of graded schools is part of the business of the State. In accordance with this principle, the general educational institutions of the whole Empire are almost without exception under public control, but in the case of industrial and commercial schools the principle is only partly realized. In consequence we find, in addition to public educational institutions, numerous educational enterprises which are carried on for economic gain by groups of private individuals. In addition, we see co-operation of such groups with the public authorities. In the case of a great number of public institutions permanent contributions are made to the cost of support by corporations of manufacturers of the particular class interested, or great unions undertake the entire support of special technical schools.

Even in the case of institutions supported entirely at public expense there are wide differences. The technical universities, in contrast with commercial universities, are everywhere maintained by the individual states, although even here in special cases the local authorities or industrial corporations make financial contributions. But in the case of the secondary and lower school systems the local community, the district, and the larger independent associations take part, in varying proportions, the differences appearing both in the control and in the contributions made for the support of the institution. With this consideration in mind, we can divide the schools into:

1. State institutions: (*a*) those which are supported entirely by the State, and (*b*) those for which private corporations furnish a share of the cost; and

2. Local community institutions — either pure community institutions or those to which either the State or local organizations contribute.

There is a third class of institution, supported by associations and unions, which is not carried on for gain, but

which requires considerable financial assistance from both the State and the city.

Turning to institutions which are maintained for private profit, we find that, as such institutions in the course of the year bring considerable money into a town, it is the custom for cities to contribute towards their support, mainly in the way of providing school buildings, either without cost or with only a moderate return of interest on the capital invested.

There are many transitional forms between these types of public and private schools, as the stream of educational development in Germany is in full flood.

A comparison of public and private institutions in point of numbers is possible only to a very limited degree, on account of the lack of exact statistics. The development of private institutions is greatest in the field of the building-trades and machine-trades schools. Compared with seventy eight public institutions of this kind in 1904, having about 13,000 day school pupils, we have about twenty-five private institutions, most of them "Technika," or, as they have recently been called, "engineer schools," of which the twelve greatest have a total of 7,000 pupils.

The organization, courses of study, and work of these private institutions vary as much as the numbers in attendance. In addition to a few which existed during a part of the last century, and have attained in consequence a reputation based upon the actual results of their instruction, there are others which behind large claims conceal very inferior work. As indications of this we can point to the low entrance requirements, the high rate of tuition, the great inequalities of school equipment, the crowded classes, the teachers, often changing, insufficient in number and in preparation, with high-sounding diplomas, but poor salaries. In contrast, experience has shown that, generally speaking, education which really advances the pupils, and which will satisfy the rapidly increasing demands upon the technical man, can be provided best in State institutions, or institutions receiving considerable assistance from the

State to supplement the income received from tuition fees. In this way it is possible to secure an excellent staff of teachers, with adequate salaries. As a result, more and more public institutions have been called into existence during the last hundred years, and the representatives of those interested in the special industries have constantly recommended and promoted such State or State-assisted schools.

In spite of this and of their narrower scope of work, the private institutions — especially at an earlier date, but to some degree now — have had considerable popularity. This is explained in part by the great promises which they make in their public announcements, the shorter time within which the pupils will be able to complete the course of study, and the greater freedom permitted to the pupils. In part the explanation lies in the earlier lack of good technical schools, and the high requirements of the public schools for entrance and at the final examinations, a disadvantage now to some extent overcome by the establishment of preparatory classes, as well as by the combination of schools of this type with the more elementary kinds of schools; and finally, in the fact that in public institutions the preparation of officials for the public service is an element that is likely to hinder any systematic adaptation of the course of study to the demands of practical industrial life. The experience gained in the schools is of help in the overcoming of these defects, and the public schools, with constantly growing expenditures, are now able to satisfy all legitimate demands.

The following explanation has reference only to public educational institutions:

The aims of institutions engaged in industrial education differ according to the positions for which their students are being prepared. The subject-matter of instruction and the methods of instruction must differ correspondingly. These again are governed by the degree of general and technical preparation the pupil possesses on entering the school and by the time at his disposal for instruction. It makes an essential difference in the course of teaching whether the

pupil can devote his entire strength to attendance at classes for a considerable period, or whether he must divide his time between instruction and a practical vocational activity that makes greater or less demands upon his power of work. In the organization of the school these things must be taken into consideration and a kind of educational work must be provided that is within the pupil's possibilities in the way of school attendance. The result of this series of circumstances is that these technical educational institutions cannot always be assigned to their proper classification. In the same institution the same teacher may have entirely different aims for different groups of pupils. Four main classes of institutions may be distinguished:

1. The technical university, which trains independent leaders and subordinate officers of the great enterprises to make intelligent use of existing methods of work and to discover for themselves new technical processes.

Between these technical universities and the middle industrial schools next mentioned stand a few rather loosely organized institutions which, so far as the qualifications of students as to previous preparation are concerned, are inferior to the technical colleges, but which likewise prepare students for independent positions in industrial life. It is usual to call their graduates "engineers," unless some special designation naturally occurs. In this class are included the Royal Industrial Academy at Chemnitz, the Higher Technical Institute at Cöthen, and the highest and perhaps the next to the highest, classes of a few middle industrial schools. These institutions could be most suitably designated as "industrial academies."

2. The middle technical schools aim to train managing officers for the greater industries, and persons who initiate and manage the lesser industrial undertakings and need to know how to follow independently the advance in technical processes. As a condition for admission to these schools a general education is universally required, corresponding at least to that which is set as the educational qualification for the one year's voluntary service in the German army. The

requirements of practical experience are not uniform: in some cases from one to two years' experience is required; in others a substitute for this practical workshop training is offered in the workshop of the school itself, or in specially selected workshops; on the other hand, in a few industries where a training in the entire business is not possible, one sees practical workshop training carried on at the same time as attendance at school. The instruction is scientific, including lectures, class-work, and practice; the advance of the pupils is regulated carefully, and promotions are made to a higher course only after the lower course has been completed satisfactorily. Supplementary practical experience is given the pupil regularly in places where workshops or business institutions exist. The length of the course in most cases is from two to three years. The passing of the final examination answers part of the requirements for admission to the technical colleges. In former times these middle technical schools were often united with general educational institutions, and this is still found in some cases.

3. The lower technical schools attempt the education of the middle and lower officials, the foremen of the great industries, and the managers of independent plants in the handicrafts or small industries. These schools are partly able to prepare for higher work, in the case of students who have either a better general education or longer practical experience, or who can return to school after additional workshop training. In some cases, special upper courses are added to lower technical schools. The requirements for admission are:

1. A preliminary general education such as is given in a good elementary school.

2. The training, especially in drawing and arithmetic, given in the continuation schools or the preparatory course of the technical schools.

3. Several years' practical experience in a trade, and at least the completion of apprenticeship.

Where in exceptional cases this latter requirement is not

complied with, practical work in a business institution or the school workshop takes a foremost place in the program of the school. Instruction is carried on sometimes more on the theoretical side and sometimes more on the practical side, but attention is always given to the principles of mathematics and science and the technology of the branch of the industry concerned, and to technical drawing. The courses of study sometimes show very wide variations. This is due in the first place to the difference in the duration of school attendance, which is sometimes only for months, sometimes for years, and which is interrupted partially by practical work in the trade. Besides, there are differences in the aims of the schools, as different degrees of dexterity in the practice of the trade are sought. Some lower technical schools, especially those with a two years' course, show in the upper classes the characteristics of a middle technical school; for example, the upper classes of the mining schools and the upper classes of the navigation schools. Others, at the very opposite extreme, for example, many textile schools, have for their aim only the thorough training of an artisan.

4. The industrial continuation schools give all the workers in the industries and handicrafts, whether apprentices or journeymen, an opportunity to acquire, without giving up their practical work in the shop, a knowledge and skill in drawing, which is absolutely necessary for efficiency in their occupations. The requirement for admission to an industrial continuation school is only the completion of the elementary school course. In no case is more required than attendance at a general continuation school in which certain subjects of instruction in the elementary schools — German, mathematics, and drawing — are reviewed and finished. The aims of the various schools are different. The special features of the particular industry can be taken up more or less thoroughly, according to the number of hours available in the week — which for the most part will not exceed eight or ten, in the evening, on week-days, or on Sunday forenoons — and according to the length of school

attendance, which at best can extend over only a few years. In consequence of these conditions, the continuation schools must of necessity confine themselves within narrow limits, and their success is accordingly often less than is expected. While some study of bookkeeping and business calculations, in addition to technical instruction, is often introduced for handicraftsmen and persons engaged in small independent businesses, the worker in a factory has little interest in these subjects.

Long attendance and satisfactory progress in a continuation school often serve as preparation for the lower technical schools, or as a substitute for their lowest grade.

The grouping of the various classes of schools is very different in the individual States. These differences are the result of a long course of historical development, modified to meet changing conditions. Thus the individual states have no thoroughly worked out plan, established from the beginning, and the present state of the schools does not satisfy either fundamental demands or the practical needs of the present day. The distribution of the schools is often bad; in many industries certain grades of technical institutions are lacking; whole fields of education — for example, the technical training of handicraftsmen — are only now beginning to be fully covered. If this is true in the individual states, these disadvantages come into view still more plainly in the German Empire as a whole, where through lack of uniform direction no systematically concerted effort is possible, except in rare cases.

In the field of mining production, we have various types of schools for mining — advanced technical schools, lower technical schools, middle technical schools, and continuation schools; the latter being established chiefly as preparatory schools for the lower technical institutions — mining academies, departments of mining in the technical college of Aachen, mining schools with upper classes, and preparatory mining schools. All these schools train mining officers and State technical officials.

In the field of industrial production, we distinguish three

groups — the mechanical trades, the chemical trades, and the building trades.

Under the mechanical trades the metal and the electrotechnical industries are included. Besides the divisions for engineering, ship machinery construction, shipbuilding, and electrotechnology in the advanced schools and in the technical academies, we have middle technical schools (known in Germany as "Höhere Schulen"), lower technical schools, and continuation schools for the machine and electrotechnical trades, as well as a large number for the various branches of metal work. The textile industries are not represented in the advanced technical schools, but for this branch there are middle and lower technical schools, and an extensive system of continuation schools and schools for weaving and the other house industries. In the woodworking trades, besides continuation classes, there are found only cabinet-makers' and industrial art schools, in combination with other lower technical schools, especially those for wood-carving.

In the field of the chemical trades there is a very highly developed scheme of instruction, including the universities, the departments of chemistry and foundry work in the technical colleges, the mining academies, and agricultural high schools, and the industrial academies. On the other hand, middle technical schools of this kind, if we leave the agricultural schools out of account, are found only for the brewing and artificial coloring industries. Instruction in the chemical trades in the lower groups of technical schools is less frequent, being confined mainly to two trades — smelting and ceramics; in the continuation schools this class of instruction is almost entirely lacking.

The educational arrangements in the building trades are better developed. The departments for architects and building engineers in the technical universities, together with the middle and lower technical schools and the continuation schools, provide for the architect and the civil engineer a system of educational institutions of all grades.

The different grades of instruction in the art-trades

schools cannot be distinguished so clearly from one another. In the higher schools pure and applied art constantly supplement each other; in the lower schools differences in artistic advancement, due to differences in education, make a strict classification of students impossible. From old tradition, no longer of any force, technical schools for the handicrafts are closely allied to the lowest grade of the art-trades schools.

The technical school systems for the training of handicraftsmen in the smaller industries have not kept pace with those established to meet the needs of the great industries. We find, however, the various types of schools above described — the lower technical schools and the continuation schools for the metal and electrotechnical trades, the building-trades schools with their departments for foremen, stonemasons, and cabinet-makers, and the art-trades schools. In addition, there exist in a few cities independent schools equipped with workshops offering day-time classes for several handicrafts, as well as evening classes. There are also a few technical schools which the great union of hand-workers (Handwerkerverein) has instituted for the general handicrafts of Germany. In the case of artisans who have finished their apprenticeship, special courses are offered; for example, the blacksmiths have schools of horseshoeing. The only schools that are universally found are the industrial continuation schools, with special technical courses for handicraftsmen. It may therefore be said that the educational arrangements for the handicrafts are at present only beginning to be organized into anything like a system.

In the carrying trade, there has been developed for ocean commerce a systematic scheme of lower schools for masters and machinists. Some of the work in these schools is of a more advanced nature, as a result of the imperial regulations for the examination of applicants for licenses as masters, pilots, and machinists. As for the traffic on inland waters, the States on the banks of the rivers maintain a great number of masters' schools, which are largely

of the nature of continuation schools, especially adapted to the needs of this branch of commerce.

The field of technical training for women in the industrial and commercial branches, and in the work of housekeeping, has been unoccupied until very recently, but now considerable advance is being made.

At present there are two distinct plans for establishing and carrying on the different kinds of technical schools:

1. Under the first plan, the technical schools are entirely separate from the general educational institutions and devote their attention exclusively to technical training. Each type of school offers courses of technical training of different grades, but in the same general line of work, and each is complete in itself. Students finish their entire course at one school, and do not advance from a lower to a higher school, except when they enter a technical university.

2. The second system, on the contrary, combines the middle and lower technical schools with schools of general education (Realschulen) and the technical schools themselves may include two or more different lines of technical training.

The first system prevails in Prussia; the second has been preferred in Bavaria. The technical school system of Saxony in its various forms is based upon the first system, but the industrial academy is inserted between the technical college and the middle school, and students who complete successfully the course in the industrial academy are admitted to the technical college. Other states of the Empire follow this same plan, but often with this difference, that schools organized to serve the needs of different industries are combined in one institution, which thus may contain a middle and a lower technical school under one direction, as in Württemberg, Bremen, Hamburg, and Alsace-Lorraine. For these combination schools the name "Technikum" is used.

A statistical comparison of the technical school systems of individual states of the Empire is difficult, because the different institutions are so differently organized, and vary

so considerably from each other, not only in respect to their work, but also in respect to their financial resources. Prussia, of course, and the larger States — Saxony, Württemberg, Baden, and the Free City of Hamburg — have technical school systems fully organized. The other States, on the contrary, with the exception of Brunswick, which has a technical college, are surprisingly backward in this regard, a defect which is not supplied by the numerous private schools found in the smaller States.

The organization and maintenance of a system of technical education calls for a great expenditure of money. In this, as in other respects, the technical school differs widely from the continuation school. The technical school requires at the very start a large outlay for buildings and equipment. The school building must contain class-rooms, rooms for the display of collections of apparatus and materials, drawing-rooms, laboratories, workshops, and a machine plant. In order to follow the advances in methods of work, this equipment must be kept in good condition, and new and modern equipment must be added from time to time. However, these constantly recurring problems on the physical side are less serious than the equally pressing personal problem presented by the lack of good teachers. Germany has not always taken to heart the lesson that in a technical school, as in any other school, satisfactory and permanent results are possible only when teachers of a high standard of excellence can be secured. Ever since men have been convinced of the importance of having good teachers, special attention has been given to the question of financial remuneration: as the industries offer splendid rewards to efficient workmen, the technical teachers, from whom we expect not only thorough technical knowledge and practical skill, but also teaching ability, must occupy as favorable a position as possible, in order to meet with the opportunities presented in the world of industry. The technical teacher is generally protected from being overloaded with teaching duties in order that he may be given an opportunity, in addition to his work as a teacher, to

keep in as close touch as possible with actual practice in industrial life, and to supplement his salary by outside work. At the same time the salaries of teachers are being advanced and an adequate pension provided, increasing with years of service and including a provision for wife and family, as in the case of other State officials. From all this, it may be seen what an extremely heavy burden must constantly be borne by the State.

On the other hand, the income derived directly from the technical school system is always small. It is rarely that an industry carried on in a school, or a school workshop, returns any profit, and careful calculation is much more likely to show a deficit. The tuition fees fall considerably short of covering the cost of maintenance. The question consequently arises, who shall furnish the supplementary amount required? Shall it be contributed from public funds or by private individuals and organizations? It often happens that great industrial or school associations organized locally for the purpose will undertake the entire support of an institution, or at least the principal part of the cost, but for the most part the choice lies between the two great governmental agencies — the State and the local community. The participation of both agencies in this field of education has grown considerably in the last twenty years. The division of the problem between them is not carried out uniformly. In general, it may be said that the individual cities have their own school organizations, and that schools are established by the State to serve larger districts. No doubt the city also derives much advantage from the opportunity of sending its students of middle and higher school grades to the district institution, and to this extent it is fair to call upon the city for some part of the initial cost of founding the school, or for regular contributions to the expense of maintenance. On the other hand, the State is not without interest in the success of technical schools of a local character, not only because in this way the State is relieved of the necessity of providing for the training of the many lower technical officials (overseers

and foremen) who are required in its own service, but because every increase in local industrial capacity results in an advantage to the whole State; for example, in an increased ability to pay taxes. Accordingly, some participation by the State in the support of technical schools that are primarily local can be justified, not merely in the case of communities incapable of assuming the burden but also as a matter of general policy. In particular, the interest of the State is involved in the case of those branches of industry in which the lack of arrangements for training workmen has prevented the successful economic development of entire districts and entire industries; as for example, in many divisions of the house industries and handicrafts. No final division of the problem of industrial education can be made between State and city. Neither can there be an exact calculation of the advantages to a community in having a school for industrial training.

Continuation schools vary greatly from one another both in aims and in methods of work. In the different branches of industry, the definite lines along which increased efficiency is developed — whether it be in the form of special intelligence, special knowledge, special mechanical skill, or special formation of taste of the worker — determine the type of school. It makes a difference whether the physical equipment and the teaching force of a technical school are at the disposal of the continuation school; and there are wide variations between continuation schools in the country and in a small or a large city.

The technical school provides for only a comparatively small number of students, whom it aims to prepare for independent or semi-independent positions, while the continuation school must contain the great mass of industrial youth, and, although individual technical schools require a greater expenditure of money per pupil, yet on account of the large numbers involved a complete and well-organized system of continuation schools of the different grades in city and country calls for a great outlay. The division of responsibility and financial obligations between city and

State will follow the principles governing the maintenance of the elementary school system. The local communities always provide, in the case of their own schools, both the school buildings and the corps of teachers, with the assistance of the State, however, in the case of communities that are unable, or only partly able, to undertake the burden. The State, on the contrary, must assume the duty of support in the case of institutions which are intended to serve the interests of large districts rather than of individual cities; for example, schools for the training of technical teachers. The continuation school, however, is unlike the general elementary school in this respect — that in the case of the continuation school there is a very good reason for calling upon representatives of the industries interested to contribute towards the cost of maintenance, because they have an obvious and immediate advantage from the increase in the industrial capacity of the rising generation that results from better technical training. This consideration can, indeed, lead to the unsound conclusion that the entire burden of the continuation school should be laid upon these representatives of the industries.

In consequence of the great number of pupils, a small tuition fee is generally required, but there is a tendency to give up this policy where attendance is compulsory. Many Germans believe in exacting a small fee, as both educationally desirable and as furnishing a considerable contribution towards the cost of the school. In Prussia, in 1901, the tuition fees covered nearly one-quarter of the cost of the continuation schools.

As has been said, legislation upon the subject of industrial school systems is not a prerogative of the Empire, but is left to the individual States. The laws of the Empire can influence industrial education only in indirect ways. For example, the licensing of certain occupations is under imperial control, and attendance at some technical school is practically necessary for those who wish to pass the required examination. Still the organization of these schools is not an imperial matter, but a State matter.

Under imperial authority the various guilds and associations have the right to organize and maintain schools for the training of handicraftsmen, and to adopt rules governing attendance by apprentices at these schools. The guilds cannot force apprentices to attend, but can apply compulsion to masters who do not send their apprentices. A number of special guild schools have been established, attendance at which satisfies the legal obligation upon apprentices of attending a general continuation school, but only when the instruction is recognized by the higher official authorities as up to the standard of the public continuation schools. In this way an attempt is made to prevent the guild-masters from holding classes at a time which is more convenient for their own interests, but less advantageous for the apprentices, and in general from giving a smaller amount of instruction and of a poorer quality than the general continuation school. As for special technical schools with instruction in the day-time, it is very rarely that such schools have been organized by corporations of handicraftsmen.

The third point at which imperial legislation touches the problem of industrial education is found in the general compulsory school attendance laws. Under these laws authority is given to the communities and to quasi-public local associations to require all male workers under eighteen years, and all working girls of the same age who are employed in commerce, to attend a continuation school.

In general, therefore, it may be said that compulsory attendance at continuation schools is not directly a matter of imperial legislation, but that the task has been placed in other hands. By local statutes employers are compelled to grant the necessary time to their workers under eighteen years of age to attend the continuation schools; and if need be, the public authorities must fix this time. Where attendance is not compulsory, but the youthful worker attends the continuation school on his own account, his employer must still allow the necessary time from the hours of employment. If the youthful worker is an apprentice, his master must make provision for his attendance at

the continuation or technical school, and must see to it that he attends. It is provided by law that if technical instruction is given on Sunday the hours of instruction shall be so arranged that the pupils are not prevented from attending church, or special services arranged for them.

In recognition of the importance of instruction in the handicrafts and housework for young women in industrial pursuits, schools for these classes of work have been established, and many communities are now organizing continuation schools for girls, in some cases making attendance compulsory.

As imperial legislation applies only indirectly to the industrial school system, no direct inspection of these schools is made by the imperial authorities, but the inspection is in the hands of the individual States of the German Empire. Local governing bodies within the States have wide powers, especially in connection with the lower school systems, and some of these schools are not under the central State authority. But in general the industrial school system, even where it is in the hands of the community, is subject to State supervision, by reason of the fact that the State often makes large contributions to the cost of the industrial schools of the community and thereby acquires a right to a share in the control of the schools. As a matter of fact, the State officials are everywhere in a position to exercise great influence upon the general industrial school system, even in the case of institutions not directly controlled by the State. A certain degree of uniform management and inspection is desirable, since without it there may easily be a dissipation of energy, and the resources of the schools will not be utilized fully and systematically. This is especially true in the case of such school organizations as do not bear a local character, but serve industries scattered over a wide territory.

The question of inspection and control of the industrial schools of Germany has been the subject of agitation and change for the past half-century. At one time or other, the Ministry of Education has had charge of them in every

State in Germany. At the present time the customary way of managing this matter seems to be to put them in charge of the Ministry of Commerce and Industry or of the Interior, or else under a standing commission representing one of these Ministries and the Ministry of Education. Experience has led to the conviction that the interests of commerce and industry go hand in hand with the development of systems of industrial and commercial education, and that the Ministries of Commerce and Industry cannot successfully carry out their plans for economic development of the country when the control of the industrial schools lies in another department. The industrial schools play a very important rôle in the economic progress of the industries in the various portions of the country, in the efforts made to improve the positions of the smaller industries in their struggle with the factory, and in the further development of industries, large and small, everywhere. Then, too, the questions:

(*a*) what branches of industry are to be promoted by industrial schools;

(*b*) what aims these schools shall strive for, taking into consideration the entire industrial interests of the country, and

(*c*) where such schools are to be located,

are questions for the man of affairs. The whole situation seems to require that the industrial school systems be put with the Chambers of Trade, Chambers of Commerce, and other business organizations under the control of the Ministry of Commerce and Industry, rather than under the Ministry of Education.

From 1879 to 1884 the industrial schools of Prussia were under the Ministry of Education. In 1884, at the suggestion of Bismarck, they were transferred to the control of the Ministry of Commerce and Industry, where they still remain. A commission of men of affairs and expert schoolmen, however, undertakes the actual work of inspecting these schools. In Bavaria these schools are still under the control of the Ministry of Education. In Württemberg

the control of industrial education is divided between the Ministries of Education and of the Interior, most of the actual work of managing the continuation schools being performed by a commission of practical men and expert schoolmen, headed by a representative of the Ministry of Interior, but responsible to the Ministry of Education. In Baden the arrangement is very similar, while in Saxony and Hesse these schools are under the Ministry of the Interior. In every case they utilize the services of men who know *education* and men who know the *industries*. Agricultural education is almost always under the Ministry of Agriculture.

Employers, workmen, and schoolmen should all have a share in the management of the industrial schools, as members of an advisory council or board of directors. By this means the State authorities can act in accordance with actual practice in the industries and with sound educational practice. Councils of this nature exist now under different names in Prussia, Württemberg, Baden, and Hesse, and similar reasons have also led to the establishment of such councils as aids to supervision and management in the case of local industrial schools. A technical council of experienced men from the industries — employers and employes — is of special importance in the lower grade of industrial schools. Thus important suggestions are made for the organization of the course of study, and the people in the industries take more interest in a school when they exercise, through their representatives on the council, an immediate influence upon its management.

### Commercial Technical Education

In comparing the commercial and industrial school systems in Germany, one can see that the industrial school system is a decade in advance of the commercial school system. About thirty years ago there existed in Germany, in addition to the technical colleges — at that time called polytechnics — only a comparatively few middle technical schools; and a part of the engineers, who to-day receive

their training in these middle schools, attended at that time the colleges, which of course had reached a certain definite development and bore substantially the character which they have to-day. In the field of commercial instruction, the situation at the present time is like that in the technical schools thirty years ago; a series of commercial colleges has been opened in the last few years, and others are planned, so that this highest layer of commercial educational instruction can be regarded as excellently developed. As has been suggested, the colleges have taken over, in part, the tasks which really belong to the middle commercial schools, since the entrance requirements are the same as those for the middle schools. Commercial middle schools are remarkably few in number. On the contrary, there exist a great number of lower commercial schools, some of which, in addition to preparing for commercial callings, do some general educational work. Many are carried on by private enterprise; these stand upon a lower plane of efficiency.

The question whether a special school for commercial technical education, in addition to apprenticeship, is desirable and necessary is not yet answered in a way that recognizes the great value of a systematic practical and theoretical training. There are still in Germany many sections of the commercial classes who challenge vigorously the value of a school training for the merchant, and see danger for the future business man in a long and thorough course at school, the point made being that he will in this way lose the taste for active business life, or will not develop it at the right time. Other sections recognize that attention to a thorough all-round education, in every case with a special view to the future calling, will be a good thing for the coming merchant. Those who hold this opinion demand, not commercial technical schools, but general educational institutions which will train especially in "Realien" (requirements of business), and will give a scientific foundation for the later schooling in actual business practice. From the fact that the private business schools

are very largely attended, and that Chambers of Commerce and the representative merchants and their assistants declare themselves more and more in favor of the creation of commercial training schools, it can be seen that there is a great and growing need for such schools — for schools training for the positions of heads of business houses and their assistants.

It is only in rare cases that the State has undertaken the task of establishing commercial educational institutions; usually this step is taken by individual cities, with the co-operation of the local Chamber of Commerce. Sometimes the Chamber of Commerce acts of itself, and it often happens that the educational institutions are private undertakings of teachers or merchants. It may be added that while many of these private institutions enjoy a great reputation, on account of their excellent methods and results, most of such schools are very inferior. It is especially worthy of notice that the continuation school idea has been taken up by the organization privately of commercial continuation schools. This state of affairs is not found in the field of industrial technical education. In the great cities there are many private institutions which promise to improve, by means of evening and Sunday instruction, the technical training of persons in commerce who are employed during the day. These promises are not carried out, but many credulous people are attracted. The courses are elementary and badly given, and the tuition fee is high. Such institutions are misleading, and are especially dangerous in the case of women.

Commercial schools in Germany are not usually specialized according to the different divisions of commerce. The insurance business, however, is specially treated in three advanced commercial schools, and in the commercial technical school of Aachen there is a course particularly designed for training persons for the management of business undertakings. Most school organizations, including the continuation schools, serve both classes — those who are to conduct large commercial affairs and their assistants in the

great businesses. Those who will be engaged in the retail trades, great and small, seldom derive any special advantage from the system of instruction.

There is in Germany at the present time no real system of commercial schools maintained under an organized plan of the State authorities and of the corporations of merchants and covering the land with a network of general educational institutions. A uniform scheme of commercial education is lacking in most of the individual States of the German Empire, but the institutions of Bavaria and Saxony are noteworthy.

In supplying the necessary money for the support of the commercial technical schools the representatives of the commercial classes stand first, and the city and the State must take second place. The latter agencies provide particularly for the continuation schools. The sum received from tuition is relatively more than in the industrial technical schools.

The rules governing attendance at the continuation schools apply to mercantile assistants and apprentices, and may be extended to the class of positions commonly held by women. Employers are obliged to allow the necessary time to their apprentices for attendance at the continuation schools.

For securing better teachers for the technical and continuation schools, there are special training courses. Besides this, special commercial colleges have added to their courses of study seminaries for the training of commercial teachers.

Commercial educational institutions cannot be divided into the same definite types as are found in the case of the industrial technical schools, for in commerce no sharp separation is possible between those who are to be the leaders and those who are to be the assistants, of higher or lower degree. In no other field of economic life are results so dependent upon personal ability as in commerce. Although it is true that a great part of the persons employed in the office force of a great factory or a great bank will find their life-positions at some definite point, still the way to inde-

pendent positions is easier in commerce than in other vocations. The possibility of reaching comfort, wealth, and complete independence is always before the young commercial assistant, and, according to the way things go, his hopes are not without real foundation. From this it will be seen that a separation of subjects of instruction according to the position for which a young man or a young woman is being prepared is scarcely possible. The following groups, however, may be noted:

1. Upon the most advanced commercial school (Handelshochschule) devolves the task of giving to young people who devote themselves to commerce a scientific training in the knowledge necessary for the management of business affairs, in order that they may be equal to the highest demands in independent enterprises. In addition, these schools train for government positions, especially for the officials in Chambers of Commerce. The training of teachers for the other commercial institutions is also part of the work of these more advanced schools. The central point in the scheme of instruction is the introduction to national economics, the elements of law, and foreign languages. Attention is also given everywhere to geography, study of articles of commerce (Warenkunde), and the principles of commercial technique. This latter subject, which includes the science of business, book-keeping, arithmetic, and correspondence, occupies different places in the courses of study of different commercial technical colleges, but it is required of all students, whether they have served their commercial apprenticeship or have entered college direct from a general school. There are fixed entrance requirements, and the plan of instruction is similar to that in other technical colleges — lectures and class-work, carried on with academic freedom of teaching, the time running from two to three years, with an examination at the end of the course.

2. Middle commercial technical schools, usually called by the name of "higher commercial schools," are sometimes completely independent; in some cases they form one division of a general educational institution (Realschule).

The independent technical schools as a rule prepare immediately for commercial life, and wholly or partly take the place of apprenticeship. They introduce the pupil accordingly to the technique of commerce, and give also the elements of national economics and commercial law, with a thorough treatment of geography, and the study of articles of commerce. On the other hand, the technical schools that are a part of general educational institutions give not so much a special technical training as a general training suited especially for future merchants, those elements in a subject being emphasized which are most important for the pupil's vocation. Commercial skill will be practiced only in an elementary way, and with little thoroughness.

3. The lower commercial technical schools, usually called commercial schools, but occasionally designated by the high-sounding name of "academies," are of three kinds. All they have in common is the small degree of general education that is required for admission; in the form of instruction, the subjects of instruction, and the aim of instruction they are fundamentally different from one another. The first is a purely technical school; pupils who have attended an elementary school are taken and trained in a one or two years' course in geography, languages, and the technique of commerce, so that they are better able to make use of their commercial apprenticeship; or else pupils who have already finished their apprenticeship are trained for a shorter or longer time in the general technique of commerce, in its relation to special branches of business, and besides receive instruction in the principles of commerce and law, in Warenkunde, and in the languages. The two other groups are annexed to general educational institutions; the one anticipates, by means of instruction in the technique of commerce, the problems of apprenticeship; in the other, on the contrary, the general course of instruction is so organized that it prepares only better and more thoroughly for apprenticeship than would be possible in a general educational institution.

4. In the nature of things, only a small fraction of the future merchants can attend a technical school, and the great mass of young people in commerce must be directed through the commercial continuation school to opportunities for systematic advancement. There are no set requirements for admission. These schools differ according to the duration of attendance of the pupils, in the kind of employment — wholesale or retail commerce, foreign or domestic commerce, handling of goods, or banking; in the time of instruction — evening, morning, or hours when business is quiet; in the teaching faculty available; and in the number of pupils. There are modest technical classes for merchants in the continuation schools of a little city, where only the principles of book-keeping and commercial arithmetic (and, of course, exchange) can be treated; there are worthless continuation schools, announced by swindling advertisements, and conducted by bankrupt merchants who promise to give commercial skill in an incredibly short time, for a very high tuition fee; and there are at the present time remarkably developed and systematically organized commercial continuation schools for the great industrial cities, in which, in addition to the different branches of special commercial technique, there are subjects like commercial law, geography, and the languages, taught in successive courses.

## CHAPTER III

# INDUSTRIAL EVOLUTION AND APPRENTICESHIP

THE youth of to-day who leaves the elementary school at fourteen to go to work is not only deprived of the opportunities and advantages of sharing in the results of the work of the wise and efficient of past ages, but he is compelled to enter the practical world as a breadwinner under conditions even less advantageous than those of past generations. The changes in industry brought about by the introduction of factory production, with its aggregation of workers in great cities, its minute division of labor, its intense and world-wide competition, have brought with them changes in the opportunities of these youthful workers which interfere with their development—mental, moral, and physical.

During the first half of the last century these changes brought about an industrial revolution in the older industrial countries of Europe, and efforts, more or less successful, were made to counteract some of the evils growing out of the new situation. New countries, like America, were less demoralized, as the opening up of new territory to settlement and occupation constantly presented opportunities for improving the conditions of our energetic youth. Horace Greeley in the New York Tribune used to urge, "Go west, young man." Thousands followed this advice, and made such use of the resources of the Middle West that the East was soon full of abandoned farms, farms which will in the future be reclaimed and made valuable by scientific methods of production. Now the Middle West is ceasing to be a new country, but the West and the great Northwest are opening up opportunities for the pioneer. The Middle West, like the East, is now face to face with the problem of introducing

CONTINUATION SCHOOL FOR SHOEMAKERS, MUNICH

scientific methods into its industrial production so as to utilize its unused resources.

The attempt to apply science to industry involves technical training for the worker, whether it be in the management of a great industrial manufacturing plant, or in cultivating the soil of one of our Illinois farms. In this attempt, it is important to keep in mind the fact that technical training must always be in close touch with practical life; and that the shop, the farm, and the factory must be utilized and improved, both as a commercial investment and as an educational instrument. Coöperation and adaptation are the watchwords of the new movement. Isolated action in either school or shop does not seem to lead to satisfactory results.

It will be interesting, too, to compare the attitude of France and Germany when brought face to face with the problem of utilizing scientific progress without sacrificing the personal efficiency of the worker.

During the last half of the nineteenth century, French thinkers began to point out the fact that by the introduction of the machine into the processes of manufacture, competitive production had produced a condition in which handwork requiring any considerable skill was becoming scarce. The machine had caused a division of labor so extreme that the worker ran a great risk of learning only his own part of the trade or business he was in. The workman did not become an all-round mechanic, dominating his work; but a laborer who was dominated by his work, limited and walled in by its horizon. The old system of thorough apprenticeship in France began to decay and die out, until boys entering upon a trade were not protected by a contract that provided teaching of the trade in the master's shop. In fact, a contract of any kind became the exception rather than the rule. A recent investigation shows that only one-tenth of the boys in trades were provided with any contract at all. This demoralizing situation arose in the name of freedom of labor and although many investigations have been made, up to

the present time they have done little to better conditions in France.

This decay of apprenticeship can be explained only in part by the extreme division of labor in modern industry. There are other and perhaps deeper causes — such as the ignorance and carelessness of parents, the indifference of masters, and the character and environment of the boy.

Parents do not, perhaps cannot, consider narrowly enough the tastes, the disposition, and the powers of the boy—mental, moral, and physical. It seems necessary for him to get a job, and they do not consider carefully whether he is fitted for it; whether he will be happy in it; and whether it offers him reasonable opportunities to rise. The job may be a boy's job only — one which does not lead up to and fit for the work of a man — a "blind-alley job"; or it may be a job where such extreme specialization is the rule that the boy never has a real opportunity to learn the trade or business, no matter how ambitious or capable he may be. His parents are anxious to have him become a breadwinner, and neglect to safeguard him against exploitation by the master by a contract that he is to receive trade instruction.

The master is usually too busy with his competitors to spend much time in the instruction, even if he has the disposition to do so; so the boy is left to the tender mercies of his associates. He may fall into the hands of a workman who will initiate him into the mysteries of the trade, and strive to interest him in his work and inspire him with the desire to perfect himself by observation and study; but such cases are exceptional.

The boy himself enters upon his work without any clear idea of its nature, its difficulties, and its possibilities. He has a job, and that suffices for the present. He is associated with persons older than himself, and easily takes on the habits of speech and action of those about him. In many cases the taste for work which he has brought with him from school gives way to habits of indifference and idleness. He does not get inspiration from the little piece

of a trade taught him, soon regards his work as mere drudgery, and so becomes an easy learner of the lessons of the street. He ends by giving up any desire he had for learning the trade or business, and contents himself with the rôle of a laborer, not perceiving that by so doing he puts himself at the mercy of the master.

Such are the conclusions of M. Gréard, Director of the Paris Academy, after his inquiry into apprenticeship in 1871. He says: "From whatever point of view one considers the different conditions of apprenticeship, they do not correspond with the needs of youth. The want of forethought in the parents, the indifference of the master, the impotence of the law, all betray the education of the apprentice. The development of commercial competition and progress in industrial technique are turned to his disadvantage.....
It will be generally admitted that the workshop, which ought to develop all the powers of the boy, wears out his body before nature has completed its development in form and power; blunts the intelligence which the school has tried to awaken; shrivels up his heart and imagination, and destroys his spirit of work. Deplorable school of private morals! It robs the man in the apprentice, the citizen in the workman; and does not make even an efficient workman!"

It is not necessary to describe the temptations that surround the boy of from fourteen to eighteen years of age in that unformed state when conscience and will are only partially developed, and when the guidance and stimulation of work in school or workshop is lacking. The history of crime is full of examples of these adolescents who gradually, from lack of moral support, good instruction, and inspiring work, have lost all notion of good and all taste for work, and finally enroll themselves in the army of the precociously idle; always on the watch for mischief and crime. M. Joly, who has made a specialty of the protection of youthful workers, shows that in the interval between 1838 and 1888, crime in general increased 133 per cent in France. The

increase was 140 per cent in the case of minors less than 16 years of age and 247 per cent in the case of minors between the ages of sixteen and twenty-one. He attributes this degeneration chiefly to the decline of apprenticeship, to the lack of adequate vocational guidance and instruction. Great efforts have been made to resuscitate and reorganize the French system of apprenticeship, but with little result. Frenchmen, however, are turning to the school for help. M. Gréard says: "A rational system of education will take into account the changes which have taken place in modern society and, instead of continuing to be directed toward recruiting professors, officials, and the leisure class, will follow the evolution of society and adapt itself to its needs and circumstances." While France has many excellent industrial schools, the situation in that country cannot be regarded as entirely satisfactory, in that these schools are not combined with practical work outside. Technical school instruction alone can never entirely make up for absence of practical training outside the school.

It is quite the fashion in America and Great Britain, and perhaps in France, to say that the apprenticeship system is dead. This statement has been questioned by high authorities. Mr. Carroll D. Wright, in his monograph on apprenticeship, published by the United States Bureau of Education, tells us that a new apprenticeship system is springing up, better suited to modern conditions. However this may be, it seems certain that many thoughtful friends of youth are coming to the conclusion that the employment of boys and girls fourteen years of age should not be permitted without satisfactory assurances that their general and vocational training will be cared for, both in the master's shop and in the vocational school. Parents, employers, and the State itself must protect these young people and provide a real opportunity for them to develop into good workmen and good citizens.

Germany, Austria, and Switzerland have included in their plans for the industrial education of the boy between fourteen and eighteen a carefully thought-out reorganization

of the old system of apprenticeship, combined with a system of continuation schools. Germany has reorganized the guilds mainly for the purpose of providing for the education of the boy. The plan is worthy of consideration at the present time, when so many countries seem inclined to leave the problem to the schools alone. The statement which follows with regard to Germany's system of apprenticeship is taken from one of Mr. Wright's reports as Commissioner of Labor.

### Development and Supervision of the Apprenticeship System

No comprehensive idea of what is now being done in Germany for the development of trade training can be obtained without a knowledge of the great efforts that are being made for the preservation of the apprenticeship system in those trades for which it is adapted.

In Germany, as in no other country, the people have been unwilling to break with the past. Nowhere else, with the possible exception of Austria, has the contest between the two systems of the handicrafts, or production upon a small scale, and the factory, or production upon a large scale, been more bitterly fought. This does not mean that the factory system has been looked upon as an unmixed evil, for it is plainly seen that in certain lines of work its adoption is both inevitable and desirable; but it means rather that in certain other lines of work no effort is being spared to maintain the handicraftsman in his full power and influence.

The attempt to do this, to preserve the handicraftsman and the small trades, is one of the features of the history of labor legislation in Germany during recent years. It has had as its result the formulation of two distinct industrial systems — the handicraft and the factory — and the enactment of labor codes for each. Legislation upon the factory trades follows in all essential particulars that of other industrial countries; but legislation upon the handi-

craft trades is utterly unlike that of England and of the United States, and is closely followed only by the Austrian legislation.

The central feature of the regulation of handicrafts is the restoration of the old guilds, and through them of the apprenticeship system, with all its features of training boys by masters for whom they are working.

During the early years of the nineteenth century the main purpose of the industrial legislation of the German States was to free industry from the many restrictions imposed upon it in the past. In 1845 this legislation culminated in the enactment of a general labor code. In removing restrictions, however, the effort was also made to bolster up and maintain the old guilds. The reason for this action was chiefly the desire to preserve the apprenticeship system. It was thought that the education of apprentices was a matter that should not be left to the hazard of a purely private contract. At the same time the Government was not ready to introduce a system for the official examination and regulation of apprentices. The law therefore defined anew the duties and rights of guilds and assigned to them the care of the interests of their trades, the regulation of apprenticeship, and the establishment and maintenance of relief funds for their members. Membership in the guilds, however, continued to be upon a voluntary basis.

In 1867 the Confederation of the North German States was formed. The federal constitution, adopted July 26, gave to the central Government the power to enact general industrial regulations. It was by no means an easy task to frame a law to supplant the diverse laws of the different States; but finally a general industrial code (Gewerbeordnung) was enacted, June 21, 1869. After the founding of the German Empire this law was extended by successive acts to those States which were not embraced in the Confederation of the North. The final step was taken in 1889, when its extension to Alsace-Lorraine was practically completed.

In general character, this law was similar to the industrial code of 1845. Its provisions, however, were even more liberal, and established an industrial system approaching in freedom that of Great Britain. As in 1845, however, almost immediately a reaction set in, and a movement was started to modify the provisions that limited the right to be an employer, a journeyman, or an apprentice. This movement, continuing to the present day, has radically modified the system of the legal regulation of labor and industry in the country.

The reason for this dissatisfaction with the legislation of 1869 is found in the rapid growth of the factory system after the war with France, and the corresponding decline in importance and dignity of the old handicraft trades and trade guilds. This change was looked upon by many as a real misfortune. Coming at this time, it was attributed largely to the code of 1869, which left the formation of guilds and membership in them entirely voluntary.

The means for restoring the handicrafts to their old importance was sought in the restoration to power of the trade guilds. During the last thirty years there has consequently been a determined, and to a considerable extent successful, agitation for the enactment of laws giving increased powers to these guilds. The most radical demanded the organization of the handicraftsmen in each trade into compulsory guilds, with large powers for the regulation of trade matters.

Though conducted with great energy, this agitation did not bring about any important results until 1881, when a law was enacted which introduced a number of the changes demanded. While it failed to establish the principle of compulsory guilds, this law gave voluntary guilds a privileged position. It made them organizations of employers and journeymen carrying on trades on their own account, with an authority of their own, and power to enact certain regulations, especially as regards apprenticeship, which should have all the force of law even in respect to journeymen not affiliated with the guilds. They were to create

and maintain aid funds and arbitration tribunals for the adjustment of trade disputes, and organize technical schools and other institutions for the advancement of the interests of their trades. An important change was the removal of the restriction in the law of 1869, that each guild should embrace only members of the same trade, a restriction that had prevented the formation of guilds in small towns. The guilds were made civil bodies, and given the power to hold land, to contract obligations, to sue and be sued in their corporate capacity. Finally, the collection of properly imposed dues was made enforcible by law.

This law was far from being as radical as was demanded, and the agitation for the extension of the guilds continued unabated. On December 8, 1884, a law was passed which declared that a journeyman not a member of a guild could have no apprentice. April 23, 1886, another law was enacted which encouraged federations of guilds and outlined for them certain fields of activity. The movement was advanced another step by the law of July 6, 1887, which gave additional privileges to guilds, the most important of which was the power conferred on administrative authorities to compel employers and journeymen not affiliated with guilds of their trades to bear their share of the guild expenses for journeymen's shelters, trade schools, and arbitration tribunals.

Finally, this long series of laws reached its consummation in the very important law of July 26, 1897, in which were consolidated all the earlier laws regarding guilds, journeymen, and apprentices. In bringing together in one act these various provisions Parliament at the same time introduced a number of important changes in the earlier laws. Most, if not all, of these changes have for their purpose the strengthening of the guilds and the more rigid regulation of the right to work as journeymen, to have apprentices, etc. While no general system of compulsory guilds was created, it provided that where a majority of the persons interested were in favor of it, a compulsory guild, to include all members of a trade in a certain district,

might be created by the authorities. The essential features of this system are fully shown in the following paragraphs.

Persons carrying on trades on their own account can form guilds for the advancement of their common trade interests. The object of these guilds shall be: (1) The cultivation of an esprit de corps and professional pride among the members of a trade; (2) the maintenance of amicable relations between employers and their employes, and the securing of work for unemployed journeymen and their shelter during the period of their non-employment; (3) detailed regulation of the conditions of apprenticeship and care for the technical and moral education of apprentices; (4) adjustment of disputes between guild members and their apprentices, as contemplated by the law of July 29, 1890, concerning industrial arbitration.

In carrying out this purpose the following line of action was specifically recommended by the law to the guilds: (1) The establishment of institutions for the development of the industrial and moral character of masters, journeymen, and apprentices, and notably the maintenance of technical schools and the promulgation of orders for their administration; (2) the determining of the conditions under which persons may become masters or journeymen and the granting of certificates to that effect; (3) the creating of a fund to aid guild members and their families, journeymen, apprentices, and helpers in cases of sickness, invalidity, death, or other trouble; (4) the organization of arbitration tribunals to take the place of the ordinary arbitration authorities for the adjustment of disputes between members and their employes; (5) the formation of a general business organization to advance the trades for which the guilds were created.

Membership in guilds is limited to the following classes of persons: (1) Those who practice in the district on their own account the trade for which the guild was created; (2) those who hold the position of foreman or a similar office in a large establishment; (3) those who fulfil the conditions of the above two classes, but have ceased to work without

taking up any other trade; and (4) handicraftsmen working for wages in agricultural and industrial pursuits. Other persons, however, may be admitted as honorary members.

The admission of members can be made subject only to such examinations as are prescribed by the constitution, and this examination can relate only to the ability of the applicants to carry on their trades. Membership cannot be refused to anyone fulfilling the legal and statutory requirements, nor can anyone be admitted without fulfilling these conditions.

As has already been pointed out, the German Parliament, while desiring to foster the growth of trade guilds, was unwilling to take the radical step of making the formation of such institutions compulsory upon employers and journeymen. Instead, it adopted the compromise measure by which compulsory guilds should be created only under certain circumstances and when the persons interested seemed to favor their establishment.

The law thus provides that when the majority of the interested parties in a certain district consent to the introduction of the principle of compulsory guilds, the superior administrative authorities can establish such an institution. When this is done, membership is compulsory upon all persons who, on their own account, carry on the trade to which the guild relates, whether they were in favor of a compulsory guild or not. Exception is made in favor of these persons who are at the head of large industrial establishments (factories) and those who do not employ journeymen or apprentices. These persons, however, can become members if they desire to do so. The constitution of each guild determines, subject to the approval of the higher administrative authorities, the extent to which handicraftsmen, who are employed in agricultural and industrial pursuits for wages and as a regular thing employ journeymen or apprentices, and persons conducting a household industry, shall be members of the guild.

The following paragraphs, reproducing the more important provisions of the law regarding apprenticeships, show

the great solicitude on the part of the State for the preservation of this system of trade instruction and the care taken that apprentices shall be thoroughly instructed in their trades:

"In the handicraft trades only those persons have the right to direct apprentices who are 24 years of age and have complcted the term of apprenticeship prescribed by the chamber of trades for their own trade or have practiced that trade without interruption for five years, either on their own account or as foremen, or in a similar capacity. The higher administrative authorities can, however, accord this right to persons not fulfilling these conditions. Before doing so they must take the advice of the guild to which the applicant belongs.

Apprenticeship can be served in a large industrial establishment or be replaced by work in an apprenticeship shop or other establishment for industrial education.

If an employer is a member of a guild, he is required to submit to it copies of all apprenticeship contracts made by him, within 15 days after their conclusion. The guilds may require the contracts to be made before them.

In the absence of regulations promulgated by the Bundesrath or central State authorities, the chamber of trades and guilds can make provisions limiting the number of apprentices.

In general the term of apprenticeship is three years, though it may be extended by the addition of not more than one year. The chamber of trades, with the approval of the higher administrative authorities, and after having consulted with the guilds and associations represented, may fix the duration of apprenticeship in each trade.

Upon completing his term of service, the apprentice may be admitted to the examination for a journeyman's certificate. This examination is taken before a commission, of which there is one for each compulsory guild. Other guilds may have an examining commission only

when permission has been obtained from the chamber of trades. When provision has not been made for the examination of candidates for each trade by guild commissioners, apprenticeship shops, trade schools, or State boards of examiners, the necessary commissions will be created by the chamber of trades.

The examining boards must consist of a president, appointed by the chamber of trades, and at least two members, half of whom are elected by the guilds and half by the journeymen's commission. The examination must show that the apprentice is able to perform the duties of his trade with sufficient skill; that he knows the character and value of the materials he must make use of; and that he knows how to take care of them. The knowledge of bookkeeping and accounts may also be required. The result of the examination is entered upon the apprentice's certificate.

The title of master can be borne only by journeymen who, in their trade, have acquired the right to have apprentices, and who have passed the master's examination. In general, this examination may be taken only by those who have exercised their trade as journeymen for at least three years. The examination is given by a commission composed of a president and four other members chosen by the higher administrative authorities, and must show that the candidate is able to value and execute the ordinary work of his trade, and that he possesses other qualifications, especially ability to keep books and accurate accounts, fitting him to carry on the trade on his own account.

The duties of the employer are to instruct the apprentice in all matters relating to his trade; to require him to attend an industrial or trade continuation school; to see that he applies himself zealously and conducts himself properly; to guard him against bad habits; and to protect him from bad treatment on the part of members of his household or companions. The employer must personally direct the work of the apprentice, or

place him under the direction of a competent person charged with his special instruction. He cannot require of him work beyond his strength or that which may be injurious to his health, and must not deprive him of the time necessary for his school instruction or for divine worship. Apprentices not living in the houses of their employers must not be required to perform household duties.

If the number of apprentices of any employer is out of proportion to the amount of the latter's business and the instruction of the apprentices is thereby jeopardized, the lower administrative authorities may compel the dismissal of some of the apprentices and forbid the taking of new ones, so as to bring their number within a certain limit.

The Bundesrath can determine for special categories of industries the maximum number of apprentices that may be employed. Until fixed in this way the central Government can take similar action, and when this Government fails to act the chamber of trades can limit the number of apprentices."

This law has been in operation for so short a time that it is impossible to determine definitely how it will work out. Opinions on the subject are contradictory. It would seem, however, that beneficial results are in many cases being reached. Thus, in 1898, Mr. Buyse, in his official report to the Belgian Government, on technical schools in the building and wood industries of Germany, writes as follows:

"Nothing is more instructive than to see with what enthusiasm the masters have responded to the wishes of the legislators as expressed in section 97 of the industrial code, 'The guilds have specially the right to organize and direct trade schools.' Education is the true function of the guild. These small employers, supported by their workmen, do not shrink from the necessary sacrifices. Regardless of the fact that they are forming competitors in the market, they are seeking to enfranchise the workman by the cultivation of his

intelligence and to improve his condition by improving his work. Their activity embraces labor in all its forms, and not alone in the trade school; it extends also to the vigilant supervision of apprenticeship in the shop, and of the conduct and housing of the apprentice, all of which is controlled by the tests required of persons before they are granted the right of working as journeymen or masters.

It may be said that the enthusiasm in favor of trade education comes from the side of the employers. Nine-tenths of the trade schools and the courses of lectures on trades are the work of the guild schools, many of which arose in the middle ages. Organized at first on a very modest basis at the exclusive expense of the guilds, with courses of only a few hours a week, directed by persons actually in the trades, and having reference strictly to trade needs, they have now attracted the attention of the public authorities. Many of the guilds have obtained for their schools subsidies fixed on a basis of a contract determining the reciprocal obligations of the communes and guilds. Their schools have thus become permanent and durable institutions. Under the impulse of new needs they have developed rapidly, increasing both in numbers and in the scope of their work. The character of the instruction has been transformed and the standard raised, thanks to municipal subsidies, but its fundamental principles, which it owed to its origin, have not been changed.

. . . . . .

The guilds render great service to the State, of which indeed they are really agents. The State delegates to them a part of its authority and accords to them the right of monopoly in respect to apprenticeship and trade standing. It is even proposed to make the guilds obligatory in order to give to them greater stability and strength. The State thus transfers from itself to the guilds the care of the organization of labor in the small

trades. It confers upon them the power to establish such institutions as may be necessary for trade training, both for the employers and the employes. It confides to them the supervision of the carrying out of labor and apprenticeship contracts and the regulation of disputes between employers and their employes. It gives to them the right to create funds for insurance against sickness and unemployment, and charges them specially with the training of future employes.

. . . . . .

Thanks to the guilds, the apprentice is no longer an unfortunate being, exposed to the hazards of life and left to his own weakness. He is well cared for and is educated under the most favorable conditions. From his entrance into the trade the guild looks after him. It supervises the punctual execution of the apprenticeship contract, controls the nature of the work in which his employer instructs him, takes account at least once a year of the progress he has made, and as a test of his studies makes him give a proof of his ability, and gives to him his certificate of apprenticeship. This certificate is a reliable document that carries weight throughout the Empire. The young journeyman finds a cordial reception among the federated guilds in all German cities. The master who employs him can judge of his ability and assign him work in accordance, because the declarations of the guilds are sincere and generally furnish a perfect guarantee that he has the necessary theoretical and practical knowledge."

Practically all of the guilds contain a clause in their constitution which provides that "the members of the guild obligate themselves to require of their apprentices attendance upon a trade school recognized by the guild, and to encourage them to arrive promptly at the school and to apply themselves with sustained zeal."

The guilds also, in all cases, provide for the institution

of an apprenticeship commission, the duty of which is to see that the conditions of apprenticeship are faithfully observed. At least as often as once a year they visit the shops and satisfy themselves that due care has been taken by the employers to instruct the apprentices under their charge. Especially do they seek to satisfy themselves that the provision of the industrial code which requires that masters shall instruct their apprentices in all the different branches of the trade is being carried out.

The local authorities, who are also interested in the education of the young workers, usually place at the disposal of the guild contemplating the maintenance of a school a suitable building, which they afterwards heat and care for. Often they also assist by the grant of a subsidy. In small towns the same school includes courses on different trades, but in all the larger cities there are distinct schools for the different trades.

The organization of the teaching force and of the program of instruction is such as would be expected of an institution supported by persons actually engaged in the work taught. For the most part, the instruction is given by members of the guild who are willing to sacrifice a certain portion of time from their work for this purpose. The instructors of drawing, however, must have a more careful technical training.

As regards the instruction given, everything is subordinated to making it as practical as possible. The courses in no sense prepare for secondary technical schools. Their purpose is solely to make the students more efficient workmen in the trades in which they are at the time apprenticed. They are thus trade schools in the fullest sense of the word. The fact that the instructors are for the most part members of the guild, actually following the trade, insures that the instruction will always keep in view actual trade needs.

The principal resources of the schools are the dues required of all members of the trade of the district, including even those who are not members of the guild, for, as we have

seen, the guilds have been given the power to require all the persons in the trade to contribute to the support of institutions having for their purpose the advancement of the general trade interests. In addition to these contributions it is usual for the local authorities to furnish quarters for the school and to defray the expenses of heating and maintenance. Not infrequently subsidies are also obtained from these authorities and from the Government.

## CHAPTER IV

# OUTLINE OF THE SCHOOL SYSTEM OF GERMANY

THERE is no uniform school system which prevails throughout all Germany. Each state of the Empire has its own system. These systems agree in essentials, but show many differences in detail. This is true of the ordinary academic schools, and still more true of the vocational schools that have sprung up during the last twenty-five years.

The ordinary school system is divided into:

I. Elementary or lower schools.
II. Secondary or middle schools.
III. High schools.

I. The elementary system consists of:
   A. Volks- and Bürgerschulen, the latter being a higher grade of elementary schools which lead to the secondary schools.
   B. Lower vocational schools, including:
      1. Continuation schools of various kinds.
      2. Schools for handicrafts.

II. The secondary or middle school system includes:
   A. The Gymnasia (classical schools with nine years' course, pupils entering after four years in elementary school).[1]
      1. The Realgymnasia (classical schools which teach Latin but not Greek; length of course and preparation as above).
      2. The Ober-Realschulen (which teach modern languages instead of the classics; length of course and preparation as above).

These are of equal rank legally, but the classical schools

[1] See diagram at beginning of volume.

stand higher in the opinion of the educated world of Germany.

3. The Pro-Gymnasia.
4. The Pro-Realgymnasia.
5. The Realschulen (Numbers 3, 4, and 5 are lower grade secondary schools. They take pupils as above and have a course of six years. They differ in the subjects taught, but they all grant to their graduates the coveted "Einjahrigenschein," which allows one year of voluntary service in the German army to take the place of two or three.)

All these schools are for boys. Girls' schools up to this time are less thoroughly organized, and less thoroughly equipped.

B. Secondary technical schools for industrial, agricultural, and commercial education; schools of art; seminaries for training teachers; and polytechnika.

III. The high school system includes:

A. Universities.
B. Technical, commercial, and agricultural colleges.
C. Academies for special purposes, such as mining, forestry, commerce, art, agriculture, and military science.
D. Other academic institutions.

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The elementary school system includes all institutions in country and city which every child is compelled to attend up to the age of fourteen or thereabouts, unless he can prove to the authorities that he is receiving a similar education elsewhere. School attendance is compulsory in Germany. The German government feels itself bound to provide a certain degree of training for all its people in order to enable them to co-operate in dealing with the problem of the State. The State, therefore, reserves for itself the inspection and general conduct of the school system, and controls them by laws and ordinances.

Although the schools are regulated, not by Imperial law, but by the ordinances of individual States, there is a general agreement throughout the Empire that no citizen shall be permitted to keep his children from school during the period required. Parents who fail to send their children to school are punished by fine or imprisonment, or both.

The compulsory period usually includes eight years, from six to fourteen. In Bavaria, however, and for girls in Alsace-Lorraine, it is from six to thirteen. In Württemberg it is from seven to fourteen. In Alsace-Lorraine, Bavaria, and Württemberg, the pupil is dismissed from the elementary school when he has passed a satisfactory examination. A pupil doing unsatisfactory work may be kept in school from one to two years longer. The elementary schools of Prussia are organized according to the plan of Dr. Falk, dated October, 1872:

VOLKS- AND BÜRGERSCHULEN

They include:

1. Schools employing several teachers.
2. Schools employing two teachers.
3. Schools employing one teacher:
   a. One-class schools.
   b. Half-day schools.

In the so-called one-class schools all children between the ages of six or seven and fourteen are taught in one room by one teacher. The number of pupils in such a school must not exceed eighty. In the lower grades there are usually twenty hours of instruction a week; in the intermediate and higher grades thirty hours a week, including turning for the boys and manual work for the girls.

Where the number of children exceeds eighty, or more than the schoolroom can accommodate, and where a second teacher cannot be supplied, a half-day school may be established with the approval of the authorities. Here the school instruction amounts altogether to thirty-two hours a week.

Where there are two teachers in a school, instruction

# Vereinigte Staaten von Nord-Amerika

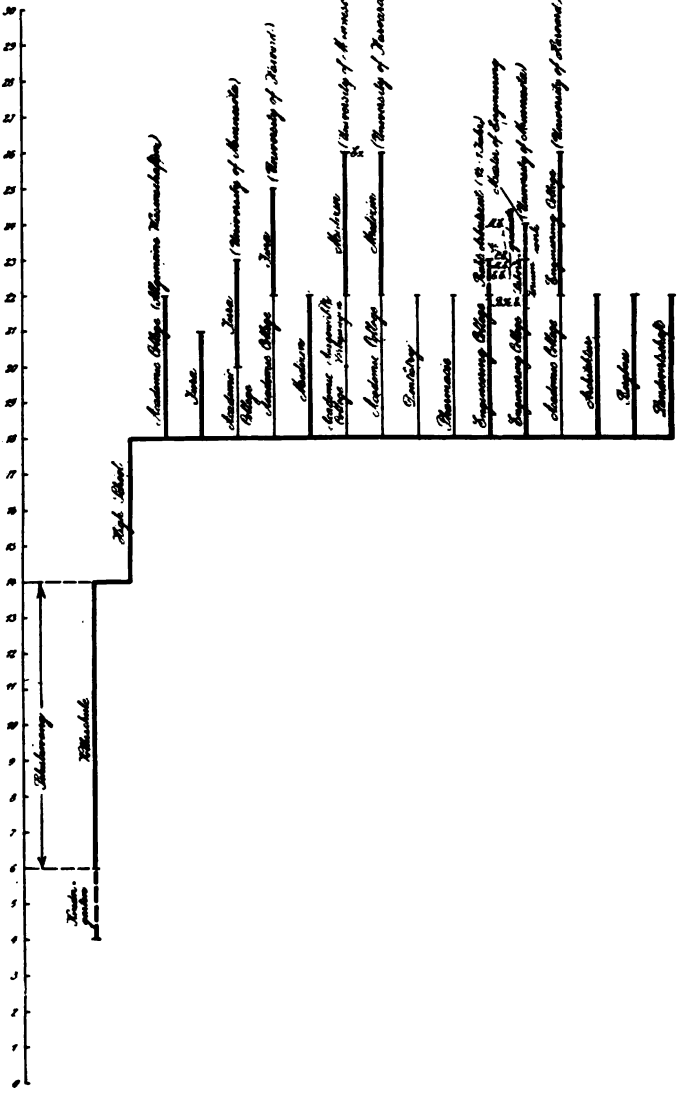
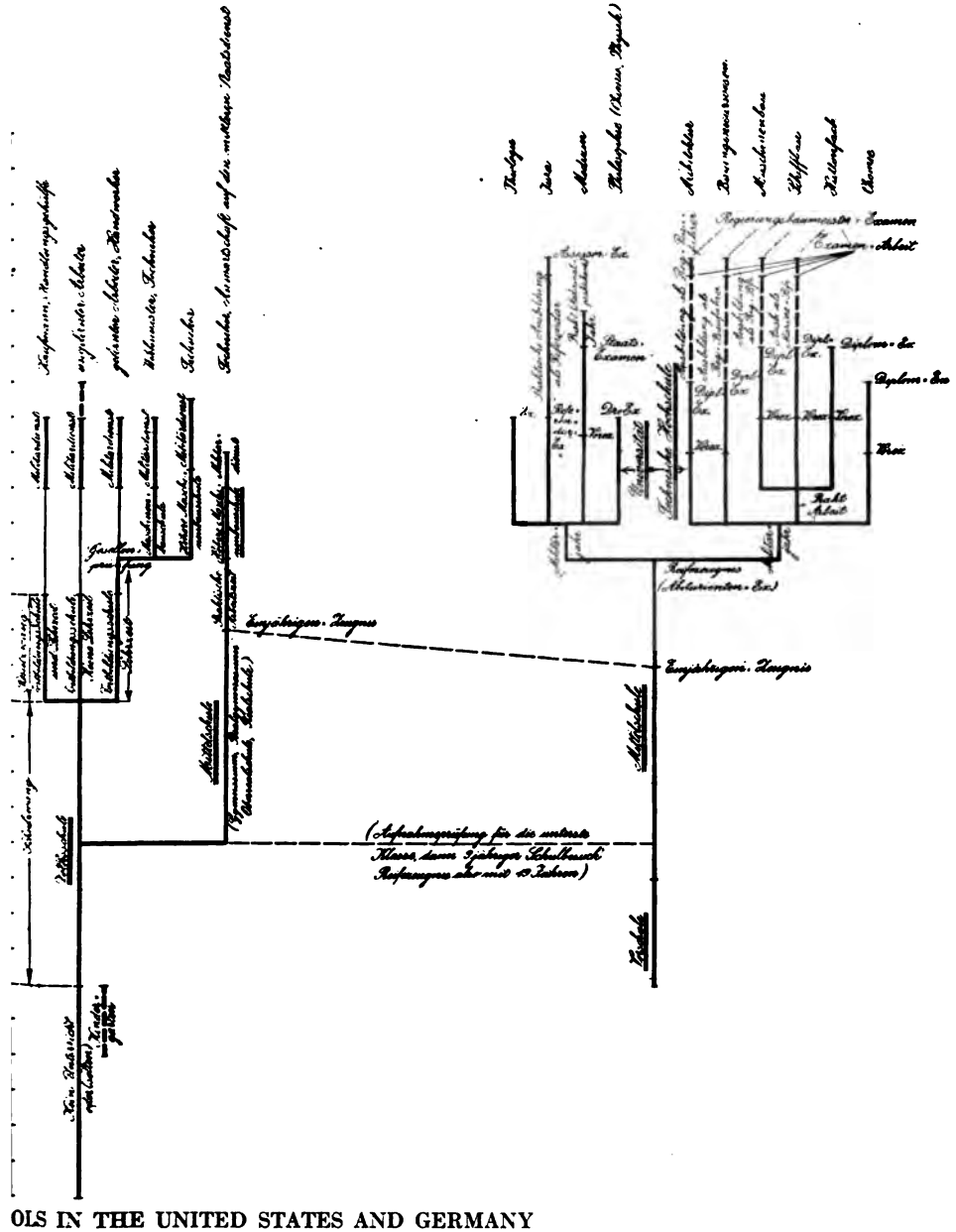


CHART SHOWING SYSTEMS OF

# Deutschland



OLS IN THE UNITED STATES AND GERMANY

Prepared by the Educational Committee of the
Society of German Engineers, Berlin

is given in two classes until the number of children exceeds 120, when a third class is provided. The third class has only twelve hours a week instruction, the second class twenty-four, and the first class twenty-eight.

The school in which there are several teachers provides for three or more classes. In the cities the usual number of classes is seven or eight, organized much as they are in the cities of America. The children in the lower grades are supposed to receive twenty-two hours of instruction a week; in the intermediate grades, twenty-eight hours a week; in the upper grades, from thirty to thirty-two hours a week. In the year 1910 there were in Prussia:

| Description of the School Organisation | In the City | | In the Country | | In General | |
|---|---|---|---|---|---|---|
| | Schools | Pupils | Schools | Pupils | Schools | Pupils |
| One-class schools | 410 | 16,516 | 13,205 | 687,893 | 13,615 | 704,409 |
| Half or third of a day schools | 79 | 6,332 | 7,794 | 662,701 | 7,873 | 669,033 |
| Two-class schools | 226 | 24,556 | 3,750 | 463,274 | 3,976 | 487,830 |
| Three-class schools | 404 | 78,759 | 4,854 | 832,230 | 5,258 | 910,989 |
| Four-class schools | 432 | 132,094 | 1,402 | 371,491 | 1,834 | 503,585 |
| Five-class schools | 362 | 131,161 | 606 | 213,386 | 968 | 344,547 |
| Six-class schools | 1,118 | 645,908 | 495 | 264,217 | 1,613 | 910,125 |
| Seven-class schools | 1,118 | 757,188 | 218 | 154,141 | 1,336 | 911,279 |
| Eight-class schools | 265 | 212,670 | 18 | 16,403 | 283 | 229,073 |
| Total | 4,414 | 2,005,134 | 32,342 | 3,665,736 | 36,756 | 5,670,870 |

Twenty-four per cent of all the school children attend the one-class or a half or a third of a day school, 34 per cent a two to four class school, 22 per cent a five or six class school, 16 per cent a seven, and only 4 per cent an eight-class people's school. This situation has improved during recent years, as more class divisions have been instituted and children remain in school longer. The number of pupils to a class was:

| | In the year 1901 | In the year 1906 |
|---|---|---|
| In the cities | 56 | 54 children |
| In the country | 54 | 53 " |
| In Prussia as a whole | 55 | 53 " |

## CHAPTER V

# CONTINUATION SCHOOLS

THE movement to continue the instruction given in the elementary school dates back to the establishment of Sunday schools in the sixteenth century. As early as 1803, Bavaria passed a law requiring the attendance at such Sunday schools of all persons of both sexes until they reached their sixteenth year, unless they were still attending another school. The main purpose of such supplementary schools was originally moral and religious instruction. This purpose has never been lost sight of in the continuation schools of Germany, although many of them do not, at the present time, give definite religious instruction. In some parts of Germany, however, a definite portion of the time of the continuation school is given to religious instruction, usually under the direction of clergymen. Even in cases where the school authorities do not set aside time for religious instruction they still encourage clergymen to give it in the school buildings but not during the hours set apart for continuation school instruction.

The industrial revolution of the first half of the nineteenth century made very radical changes in the position and powers of the guilds. These institutions declined in importance and number, and with their decline came a great deterioration in the quality of the instruction given to apprentices in the industries. The master's shop did not provide the kind and quantity of practical and theoretical instruction required by modern conditions, so the Germans attempted to use the continuation school as a supplement to shop instruction. In many parts of Germany — especially in South Germany — many of the ordinary Sunday and evening schools were turned into vocational evening and Sunday schools. There was a general feeling that, while the elements

**CONTINUATION SCHOOL FOR COPPERSMITHS**

of culture should not be entirely neglected, greater attention should be given to vocations. In 1869, the North German Confederation introduced into the trade regulations a provision requiring the attendance of all workmen under eighteen years of age at continuation schools wherever these existed. Under these regulations, compulsory continuation schools are found in all the larger communities of Germany. In fact, twelve of the twenty-six German states have passed laws requiring them. In the remaining states, local authorities acting under the trade regulations are permitted to establish compulsory schools if public opinion justifies it.

With the establishment of the German Empire new demands were made upon the continuation school. Manhood suffrage was introduced in all Imperial matters, and better civic instruction was needed for those who were to exercise the franchise. The ordinary elementary school could not provide its pupils with this kind of instruction, largely on account of their immaturity. From this difficulty arose the third function of the continuation school: training for citizenship.

These three main lines of influence — religion, economics, and social politics — are marked in the modern continuation school. No one of them, as Mr. H. A. Clay says, has ceased to operate, although the relative importance of each has not been settled in exactly the same way in any two countries of Germany. Indeed, within the limits of a single state are to be found wide differences in the emphasis placed upon one or another of them.

Dr. Kerschensteiner, Director of the schools of Munich, has been a pioneer in the movement to harmonize the moral and religious, the vocational and the civic points of view. In 1902, a prize was offered by the Royal Academy of Science of Erfurt for the best essay on the "Training of Youth for Citizenship during the Years between Fourteen and Twenty," that is, in the interval between a boy's leaving the elementary school and the time when he enters upon military service. Dr. Kerschensteiner's essay won the prize, and has since exercised a wide influence upon the develop-

ment of continuation schools both in Germany and in the other countries of Europe.[1]

In this essay Dr. Kerschensteiner takes the following ground:

1. That the work of the primary school cannot be regarded as an effective means of training for citizenship, as the boy's experience in social matters is too limited, and he is mentally too immature. For these reasons the training of the elementary course of study fails to exercise the desired influence upon the pupils.

2. That for the child of fourteen who leaves school to become a breadwinner all systematic education practically ceases. This takes place just at the time when the influence of the family begins to weaken, and where the lack of control over the boy may have a most baneful effect upon his moral character.

These considerations have led Dr. Kerschensteiner and all the leading educators of Germany to insist that the State should provide compulsory instruction in continuation schools for all boys between the ages of fourteen and eighteen. He points out that it is inconsistent for the State to provide compulsory elementary schools and let the youth go just when he most needs help and when character-building is most necessary. "Is it not strange," he urges, "that attendance at school up to the age of eighteen or nineteen is required for the small fraction of our people destined for the liberal professions, although they spring from families which possess both the means and the intellectual qualifications for performing their educational duties, while we expose the majority of their future fellow-voters, when they are little more than children, to the dangers of everyday life? The little that we are able to give in the elementary school leaves them as open to the evil tendencies of everyday life as to the good. As it is impossible to give definite direction to the character of the boy at the ages of thirteen and four-

[1] It has been a part of the work of the Commercial Club of Chicago to make this essay available to all American and English students of this question. The Club has secured the American and English rights to this book, and has had it translated. It is published by Rand, McNally & Company, of Chicago.

CONTINUATION SCHOOL FOR TINNERS, MUNICH

teen by means of the elementary school, and as young people at that age are, without exception, selfish, our primary education is for the individual, and still more for the masses, a gift of the Danaides rather than a bounty from heaven. We give the people all too readily a fire which they cannot tend, a hammer which they cannot wield, and a cast of mind in which the demagogue who promises everything can work more easily than the leader who remains faithful to high principles."

Dr. Kerschensteiner declares that the main purpose of the continuation schools is training for citizenship. The securing of personal and vocational efficiency is to be regarded simply as a means. Training for vocational efficiency is made the first step toward securing all-round efficiency, on account of its appeal to the boy as well as to the practical man. But besides the personal vocational efficiency secured by this training there are developed the civic virtues which are the real foundation of all higher moral training: conscientiousness, perseverance, self-restraint, devotion to a strenuous life. These are the real things that we are after. We must lead men to think and act under the guidance of ideals that include something more than self-interest.

In this training, attempts are made to give insight into the relations of individuals to one another and to the State; to extend knowledge of the laws of health, and to employ the knowledge gained in the school in the exercise of self-control, justice, and devotion to duty, and in leading a sensible life, tempered with a strong feeling of responsibility.

According to Dr. Kerschensteiner an education devoted exclusively to technical training for an occupation is not worth much as a preparation for citizenship. It is quite as likely to encourage selfishness as to encourage altruism. "The school which devotes not a single moment of the day to any other interest than that of personal gain or the desire to become an expert worker so as to gain the greatest possible advantage over competitors in the economic struggle is hardly a suitable nursery of civic virtue."

Other educators emphasize the idea of pure technical

training, and not a few regard these schools as mere institutions for reviewing and perhaps supplementing the training of the elementary school. In other words, there are schools still under the domination of the old-fashioned pedagogy which regards trade instruction as utilitarian and barbarous. But the weight of governmental authority is laid upon the training for citizenship and manhood through and in connection with vocational training.

### What Is a Continuation School?

In the widest sense of the word, all educational institutions which devote themselves to the further training of young people who have outgrown the elementary school are continuation schools. We may include under the term all sorts of secondary technical schools, such as schools for the building trades, machine trades, and wood-working trades, but such a classification is not usual. The term also does not include trade schools, which are a substitute for apprenticeship and which undertake to give the education of both the shop and the continuation school. These schools are day schools which take the whole time of the pupil so that he cannot be employed at the same time in the school and in the workshop or establishment of his master. Continuation schools proper are schools which young people attend only a few hours a week, most of their time being spent in business or the workshop. All schools which give young people in apprenticeship or in employment of any kind the general civic, social, and vocational training which forms the necessary supplement to the workshop or business are continuation schools.

These continuation schools are schools for the people in the fullest sense of the term — schools which attempt to deepen the general education already obtained, to apply it to lifework, and to supplement it by developing industrial intelligence. Many of the special technical schools founded by guilds and associations, such as the cabinet-makers' schools, commercial schools, and shoemakers' schools, are continuation schools, although they

emphasize technical instruction too much, and fail to continue and deepen the general education obtained in the elementary school.

### Problem of the Continuation School

It has been pointed out that at least two purposes lie behind the movement for technical schools: one economic and one cultural. In the case of the schools for the promotion of handicrafts — the secondary technical schools — the economic motive is more prominent, but the cultural motive demands equal consideration in the continuation school. Young people who at the age of eighteen or twenty voluntarily enter a secondary technical school must often devote their entire efforts to the attainment of technical skill. The case is different with the youth of fourteen. He needs both culture and vocational knowledge and skill, — perhaps culture through vocational knowledge and skill. At this most important age character-building should be the main purpose.

The youth from fourteen to eighteen is not a child, but an adolescent with different interests, powers, and experience. He is not simply a larger child, and the instruction for him, at this age, should not be a mere repetition of what he has learned before, but must take into consideration his newly-developed capabilities, his special interests, and his special needs. It cannot be instruction that merely repeats or enlarges the work of the elementary school, but must have a different ideal and employ different methods, which are in harmony with his new experience, interests, and powers.

The life of the child of elementary school age lies in general within the narrow limits of his family, the neighborhood, and the school. These form his world, and upon them he projects all his impressions so that they represent the center of his interests and of the experiences which condition his view of the world. This experience must form the basis of all instruction of children in the elementary school, as their world of ideas can be built up only around these centers of experience.

Ninety per cent of the young people who leave the elementary school at fourteen go into some employment. They go into shops and factories or perhaps become servants; they establish new relationships and come into new surroundings which are usually not in harmony with their former experience and views of the world. The newly-gained ideas and experiences, on account of their special freshness and clearness, dim and to some extent crowd out earlier ideas and ideals, and dominate the consciousness of the developing youth. Unless wise guidance and instruction can be furnished him at this time, there is danger ahead — a danger which is now apparent to thinkers all over the world. Some attempt must be made by society to furnish him guidance and assistance in finding himself at this most important stage of his career. The continuation school is an attempt to provide such help at this critical time. The experiences of the boy in his vocation form the natural center for continuation school instruction, because his interests, his dominating ideas, are connected with his vocation; and these ideas and interests, clarified, rationalized, and moralized, can be used to good purpose in building up a moral individual and a citizen.

But can these interests and fundamental ideas be classified so as to make them the basis of instruction in the continuation school?

This question is not very difficult with boys who are so fortunate as to enter into an apprenticeship to prepare for a specific trade. Their trade forms the natural center of their interest, and furnishes them the most of their experience, and this makes very clear the lines along which instruction should be given. But besides these, there are many young persons who enter factories, become house-servants or messengers, or perform all sorts of odd jobs of the community, What shall we do with them? Is there a center of ideas around which we can organize their instruction?

These young persons cannot have any deep personal interest in their job, except as a means of earning a living for themselves and perhaps for those dependent upon them.

They realize that they must often change their positions; they are interested in other similar establishments of the community in which they may be called to serve. Their center of ideas lies in the ceonomic conditions of the neighborhood. The young man is interested in earning money, and as much money as possible, to support himself and his family. His interests, then, are largely economic. He can therefore be interested in everything pertaining to the business of the community he lives in: its production of goods, its commerce and trade, its capitalists, and its workmen. He is also interested in the government of his little community. He has to pay taxes; he votes; he racks his brain over the question as to what becomes of the money contributed by tax-payers. Unscrupulous men undertake to encourage suspicion as to the fairness of the governmental regulations under which he lives. As in the elementary school, it is still the home which demands his interest, but the home in a new aspect — in its economic and social relations.

The girls who leave the elementary school may be employed in housework, as servants, saleswomen, or factory hands, or perhaps in some skilled trade, such as tailoring or millinery. It is not difficult to arrange a school program with a definite center for such young persons. Germany, however, believes that all girls, even those entering skilled trades, are especially interested in the idea of a well-conducted, well-regulated household, and that all girls feel instinctively that they are destined eventually to manage such a household. Household economy may then easily be made the center of interest for a great majority of the girls. A school making household arts its center of interest and work not only succeeds in interesting its pupils, but plays a very important part in working out a great social problem.

Further, as the life of the feelings and will of men is closely associated with their controlling ideas, through which their feelings arise, it seems clear that apprentices or boys in the factories must be reached through the mass

of ideas which interest them and control them, and which are usually connected in the closest manner with their trade or occupation. In this way we may hope to influence their wills and characters; in this way we may hope to develop feelings of duty, of joy in work, of self-respect; in this way we may hope to bring out their steadiness and endurance in following out ideals; diligence, loyalty, and conscientiousness in carrying out work; energy for overcoming difficulties, dislike for idleness and slovenly work. With these moral ideas may be developed such national ideals as patriotism and loyalty.

We may sum up the problem of the continuation school as fourfold:

1. It must strengthen and deepen the moral ideas of the youth and give him further moral ideas developed out of his new surroundings and new experiences.

2. It must put him into social relations with the community and State.

3. It must advance his vocational training, and, in connection with this, develop his general education.

4. It must fill up the gaps in general training which seem likely to be detrimental to success in the vocational world.

From an ethical point of view, it may be hard to justify taking the third ideal as the center and grouping the others about it. There is, however, no question but that the third ideal is the pedagogical center of all the instruction in the continuation school; through it we may strengthen the other three ideals. Through their desire to become efficient vocationally, these boys are brought to see their relations to society and the State and to realize the advantages of a broad intellectual development.

### Organization and Arrangement

The demand that the vocation stand as the central point of the entire organization of the continuation school determines its course. The assignment of pupils to these schools and to the individual classes cannot possibly be

based upon age or the grade of school from which they come, but must be based upon the vocation they follow. The leading objection to this system is that it makes gradation and methodical advance difficult; but gradation is not an end in itself, as it sometimes seems, but only a means to be employed as long as it is helpful. In this case it is not helpful, but demoralizing. The following illustration shows this:

If you take a class in a continuation or evening school grouped according to age or to the grade reached in the elementary school from which the pupils come, you will have, perhaps, shoemakers, tailors, bakers, butchers, blacksmiths, carpenters, masons, all in the same class. Suppose you undertake to teach them mathematics. The problems will deal either with generalized experience or, if specialized at all, with commerce. As very few of the class will be engaged in this pursuit, the appeal of the book will be very limited. The body of experience referred to in its problems will be strange and will make the work difficult for nearly all the pupils. Commercial arithmetic itself is, it is true, a step in the right direction; but, if we were logical, we should have an arithmetic for tinners, an arithmetic for shoemakers, one for carpenters, etc. The kind of mathematics needed in the continuation schools is mathematics as applied to particular occupations, and not the general treatment of the subject that passes current at the present time. Suppose you should undertake to teach this same class bookkeeping. You would compel the shoemaker to note down in his blanks the sausage-selling of the butcher, the mason to attend to the customers of the barber, or the blacksmith to serve the guests with the waiter. This means that the bookkeeping will be confined to one industry and all other pupils must work through this bookkeeping whether they know anything about the industry or not, whether it can serve as a model for them in any way whatever, and whether the work in general be useful or useless. Much has been sacrificed to the principles of gradation in the elementary schools, and infinitely more will be sacrificed if we keep the same

notion in organizing and managing the continuation schools. The logical thing is to organize them according to vocation; then the experiences dealt with will always be real and vital and uniform with the pupils. There will be, of course, many opportunities for gradation within the vocational groups themselves and these opportunities will be utilized in larger cities. The point is that gradation is a secondary, not a primary, consideration in the organization and management of the continuation schools.

The continuation schools are divided into:

1. Industrial Continuation Schools.
2. Commercial Continuation Schools.
3. Agricultural Continuation Schools.

In cases where numbers will not permit organization into the three groups above mentioned, but where one continuation school must provide for all, this general continuation school must not be regarded as a school merely for giving general instruction. It is a vocational school working under somewhat peculiar conditions.

In these schools the idea of the vocation as the center controls in every relation and in every group.

In the commercial continuation schools, on this principle, the pupils are all from industries so nearly alike that the classes can be organized and managed without any special trouble.

The organization of the industrial continuation schools is not so simple a problem. If there are enough representatives of every handicraft to form a class, as there may be in the larger towns, there is no difficulty. We simply organize as many cabinetmakers' classes, shoemakers' classes, etc., as are required, and may, in addition, undertake some gradation based upon ability and experience. In other cases, we have to group into one class pupils coming from related trades. We can solve the problem in a large number of schools by the group method of organization. We may divide the pupils, for example, according to the materials in the shops in which they work; or according to the articles that they produce. We may have, according to the first

principle, the following group: metal-workers, wood-workers, stone-workers, workers in cloth, etc. According to the second principle: workers in the building trades, workers in the clothing industries, workers in food industries, workers in metal trades, workers in art trades, etc.

We may have to combine the principles, and organize classes which will recognize both: e. g., we may have metal-working classes, wood-working classes, building trades classes, classes for the clothing industries, classes for food industries, and art-trade classes. In every case the problem must be studied with the view of finding one or more points of contact in the experiences of the groups of young people to be classified. There is always some point of resemblance or center of interest that can be seized upon as a basis for classification. Difficulties notwithstanding, this is the only organization that can make the instruction real, vital, and useful.

There are cases where pupils come in from elementary schools in which the work is so poor in quality and so small in quantity that they are unable to work profitably with the others. It is sometimes necessary to provide introductory classes for such young people, if we are not to waste their time and interfere with the progress of the other members of the classes. It is not wise to be too rigorous in this matter of classification. It is not wise to consider too closely the record of the boy while he was still a child in the elementary school. With his new development, new interests, and new powers, he often makes a record in the continuation school radically different from that entered against him in the elementary school. It is better to give him a chance than to settle the question of his classification on the basis of what he has accomplished or failed to accomplish in another sort of a school.

The subjects taught in the continuation school are: mathematics, including geometry, German, the theory of business, bookkeeping, and drawing, all taught from the industrial point of view. To these is added vocational theory; and, in many schools, civics and hygiene.

In vocational theory, the attempt is made to give the pupils theoretical instruction, and, where there are workshops in the school, practical instruction in their vocation, with a view to developing industrial intelligence rather than skill. This amounts to a kind of technology of their trade, and some knowledge in detail of the processes of the workshop, some acquaintance with the historical development of the trade they are in, of its social position at the present time, of the trade regulations governing it; in general, knowledge which they will find practical afterward. The theory of the trade (Berufeskunde), accordingly, is instruction which applies the results of natural science, mathematics, technology, geography, economics, and law. All these are valuable for the general training of the pupils and all are presented as projected upon their vocation. Vocational theory is the center of all the teaching, and all instruction in other subjects is carried on in connection with it.

If, as in Munich and many other cities in southern Germany, the schools have workshops, all this theory of the trade is taught in connection with practical work in the shops, where the theoretical instruction is tried out, and the master's instruction is supplemented and improved. The school shop is not used as a place to teach the boy the whole trade, but simply to supplement and explain the work done in the master's shop. Many German educators are coming to believe that the attempt to teach the theory of a trade or vocation without the use of the school shop is a mistake. At the present moment, the movement for school shops is gaining ground very rapidly in all parts of Germany.

The instruction in mathematics in the continuation school turns entirely upon the business of the handicrafts concerned. The future handicraftsman learns to apply his mathematics in the right way to his field of work. In his class in the continuation school he must have practice in those kinds of mathematical work which will come up in the trade itself. Cost estimates stand as the center of instruction in arithmetic. The competitive ability of the handicraftsman will depend not only upon his skill, but

also upon his ability to estimate the cost of the article he is producing.

In teaching the mother tongue, the same principles apply. It naturally follows that in composition work a business vocabulary and business forms are used. A large part of this instruction is business correspondence connected with the system of bookkeeping — a system adapted to the needs of the trades represented.

The continuation school takes advantage of the opportunities presented in the study of the mother tongue for strengthening the moral and patriotic ideals and feelings of its pupils, and for educating them in common sense and civic virtues. This demands the reading and careful discussion of suitable selections of prose and poetry. The work may be so arranged that home reading is required on the part of the pupils; and the work done at home and in the school can be unified by means of the discussions with the teachers. In this way is developed an interest in good reading which will be a continued source of joy and profit.

Drawing is the very alphabet of the industries, and must be thoroughly taught in almost every class in the continuation school. On account of the limited time available, it is impossible to train all pupils thoroughly in all fields. Instruction must be divided between freehand and mechanical drawing. The pupils must receive training in the kind of drawing which their trade especially requires. For example, painters, lithographers, and engravers need freehand drawing; cabinetmakers, machinists, and blacksmiths need mechanical drawing. At the same time, it is advisable to give the student of freehand drawing some little skill in mechanical drawing, and the apprentice taking mechanical drawing some skill in freehand work. In connection with this work in drawing some instruction can be given as to style, historical development, etc.

The drawing is based upon practical work in the workshop and is executed there whenever possible. The sketching, planning, and careful drawing of working plans is always related to their execution in the shop and

no attempt is made to teach drawing as a separate subject. The aim is to develop taste and practical ability to read and work from a drawing or blue-print. This can be acquired only by practice in making a drawing and then executing it in the shop.

In classes in the art trades, the problem is very different. The work is of a more elaborate technical character and is often followed by courses in the art trades school. In fact, most, if not all, of the art-trades schools have continuation classes in the evening for young people who intend later to enter the secondary art-trades school, or who wish more advanced work than can be given in the ordinary continuation school.

### Size of Classes and Hours of Instruction

The classes are smaller than in the elementary schools, seldom including more than 30 pupils. The method of instruction is quite largely individual. All grades of cultural and practical ability are found in classes of boys from one trade. Each pupil is permitted to take the work most important for his purpose, and to accomplish as much as possible in it in the time at his disposal. His neighbor may be working on an entirely different problem at an entirely different rate of speed. Unwillingness and inability to provide this individual instruction are the cause of much unsatisfactory work where the school-masters try to put in the same classes pupils of unequal attainments and ability.

The number of hours of instruction a week given to continuation school work varies from two to ten or twelve. The usual number in Prussia is six hours a week during forty weeks of the year. In Munich, Württemberg, and Baden a larger amount of time is often given. In some cases communities are permitted to crowd all the work into five winter months of the year, increasing the number of hours per week proportionately. This scheme meets with strenuous opposition on the part of men who really believe in the continuation school as a means of culture. They

insist that continuity through the larger part of the year counts greatly for effectiveness, which depends not upon knowledge so much as upon the training of the will and intellect, and that lumping the work into less than half of the year is likely to prove unsatisfactory from this point of view.

### Time of Instruction

As has been shown, the instruction was formerly given on Sunday forenoons and on the evenings of week-days. Most of the work for persons over eighteen is still given at these times, but much of the teaching for persons between fourteen and eighteen is now done on week-days before eight o'clock in the evening. In fact, it is given as far as possible in the forenoon, when mind and body are fresh and genuine educational work can be done. The proportionate amount of this evening and Sunday instruction is decreasing steadily. Some of the States have declared by law that the instruction must be given before eight o'clock in the evening; and several other States, Prussia among them, have refused to subsidize continuation schools giving instruction in the evening only. Statistics will be given later to show the percentage of instruction given at different times of the day.

The Germans tried for many years to supplement daily work in the shop by evening school instruction, but found that the strain was too great for young people between fourteen and eighteen to bear. The boy whose energies had been exhausted by a hard day's toil suffered in health from the added strain imposed by the evening school, and accomplished little or nothing there. He had had as much of the ordinary academic instruction as he wanted in the elementary school, and he was inclined to regard the imposition of six hours a week of continuous instruction in the evening, taken out of his free time, as a bit of tyranny. It required the support of fines, corporal punishment, and imprisonment in the school prisons to keep even his body at school. The recognition that the school work was a legitimate use of the boy's time and the proportionate reduction

of his working hours have caused a change of attitude on his part. Where the schools have become more practical in character, by grouping the instruction about the trade, and where the boy's rights are recognized by giving the instruction during the day, there is an excellent spirit and great interest. On the other hand, the author has seen evening continuation schools in which the discipline was maintained only by terror — schools in which the work was practically worthless, and the moral effect upon the pupil even worse. The boys began with the feeling that they were being imposed upon by having double work forced on them. The best thinkers are agreed that the teaching must be done during the day for young people during the age of development. While some employers oppose this at first, reasonable men can be shown that it is to their advantage to have in the continuation schools efficient teaching which is carried on under conditions that do not outrage the feelings of their young employes.

With day school instruction, of course, comes the problem of adjusting the school hours to the convenience of the employers. Great care must be taken to disturb shop arrangements as little as possible. Programs of work must be made only after thorough consultation with the employers concerned, and the instruction must be fixed at such hours and in such shifts as will suit their convenience. Late afternoon and evening hours are out of the question, and special buildings for the continuation schools are necessary. All schools must be in session during the usual hours given to labor: from seven in the morning until six or seven in the afternoon. Usually it is advantageous to both master and school to have the instruction continue for two or three hours at a time, and one hour is the minimum. In many cases masters have wished to have it all given during one day. This makes a hard program — especially if to the six hours of school four hours more of work in the shop are added. Under such conditions, any school man will recognize that the boy is being overworked.

With special buildings open all the time, there must be

special corps of teachers. It is a distinct advantage to these schools to get away from the system of employing only teachers whose main work and main interest are in the day schools, and whose methods are based upon their experience in the other schools. In the continuation school, the mathematics, drawing, English, etc., must all be applied in the most direct and practical way to the vocation. The ordinary teacher is not capable of giving this sort of instruction without special training. The continuation school system must build up an organization of its own with a certain percentage of the teachers employed continuously and with other teachers of special subjects engaged to supplement their work. The teachers employed continuously should be teachers who have received special practical training in the shops, and practical men selected on account of their interest in teaching, who have been given special training in pedagogy. It will take time to build up a system of training for such teachers. In Germany there is only one special school for this purpose. Most of the special training is taken by teachers and practical men during vacation. The Government often provides courses of instruction running from four to six weeks during the summer months and during other vacations of the school year.

### Supplementary Organizations

In connection with these schools the ideal is to provide a system of coöperative institutions, such as homes for apprentices, excursion clubs, systems for the use of playgrounds, public baths, special libraries suited to their special purposes, and evening entertainments. In the best organized systems buildings used for continuation school work have rooms to which the pupils may come evenings and Sundays, or as they can, for preparing work, reading, for amusement, music, etc. Each of the continuation schools of Frankfort, for example, is provided with a club room, which is in great demand. Excursion clubs are formed as in the other schools, and the boys are encouraged to visit places of

interest under leaders chosen by themselves, who will be responsible for their conduct. In this way or with their teachers they can both advance themselves in their trade and have a good time together. By systematic arrangements continuation schools in Germany are able to secure the use of public playgrounds and public baths at certain times. These are used very frequently and very successfully, and public-spirited citizens have undertaken to secure effective supervision for them. The work in the mother tongue can be managed in such a way as to encourage the use of libraries containing special technical books which bear on the subjects the boys are studying. This habit of reading books bearing on their technical employment is of great use to the boys during their entire life. Evening entertainments are provided in these schools at which lectures illustrated by lantern slides are given; the pupils are encouraged to get up programs themselves, and pupils, parents, and teachers can meet for the betterment of conditions in the school. Many such agencies are employed in Germany in connection with the continuation school. They tend to build up a feeling on the part of the pupils that is immensely helpful to such schools. The old boys come back to these entertainments, and take part in supporting school enterprises. The continuation school becomes an individual factor in the life of the community, just as distinct and well marked as any other school.

### Support and Management

Continuation schools are organized and supported by guilds, by associations of workmen, by manufacturers, and by communities. Sometimes they are assisted by State contributions, sometimes not. The tendency is becoming greater every year to have the State make substantial contributions and take a very decided part in the management. While the guilds probably control about five hundred schools in Germany to-day, the number is diminishing, and the influence of the State is becoming constantly greater. Many of them receive some assistance from the

CONTINUATION SCHOOL FOR CARPENTERS, MUNICH

State, and each year the habit grows and the State is expected to pay more. There is a good as well as a bad side to this. In the case of schools managed by the guilds, the instruction tends to be too narrowly technical, and to confine itself to the training of the mere workman, while with the assumption of authority over these schools by the State has come a demand for training for citizenship.

There are over fifty continuation schools in Prussia, conducted by manufacturers within the factory. The manufacturer feels that he saves valuable time by having the school in the factory, and better discipline can be maintained and more practical results secured. The manufacturers support these schools, but are required to submit their plan of work to the Government for approval. These schools are made up of carefully selected boys who are very thoroughly instructed in technical lines, quite commonly being given one full day every week for this work. In the school of Ludwig Löwe in Berlin about eighty boys are instructed by five teachers, who are allowed one full day every week for this purpose. The school building is very much better equipped than the ordinary public school building. The teachers are mainly engineers with some pedagogical training. Such schools, however, on account of the limitations as to admission, can hardly be classed as public schools. They tend also to be more narrowly concerned with technical training than with making men and citizens.

In the larger towns special boards of officials who represent employers, employes, and educators assume the general direction of the school. Each school has its own director and the system of schools often a director who is a member of the managing board. It is a general custom to have this board distinct from the board controlling the elementary and secondary schools. Each individual school, and sometimes each division that devotes itself to a particular trade, has an advisory committee composed of employers and employes in the trades concerned. They are encouraged to visit the school, to make contributions of material for its use, and to make recommendations for courses of study and technical

teachers. In this way the practical men of the community become interested in the work of these schools, and assist in keeping them efficient and practical. A general feeling of confidence in the school and interest in its work prevails wherever this takes place. The director of the school may be either a technical man or a teacher who has had a technical training. He must be a man who has the confidence of the practical men in the community, or his school will lack the backing necessary for success.

The attitude of employers is almost universally favorable to these schools. The employes are almost a unit in supporting them. Some employers whose work is disturbed to a small degree by the day school programs make some complaint, but these men are the exception, not the rule. It may be fairly said that the industrial communities of Germany are agreed as to the importance of the continuation schools; that they recognize the absolute necessity of supplementing the old apprenticeship system by such schools; that, as a rule, they are satisfied that such schools must be made compulsory, and that the instruction must be given during the working hours of the day.

### Continuation Schools of Munich

The system developed in Munich, in many respects the most interesting one in Germany, is the creation of the present superintendent or director of schools, Dr. Georg Kerschensteiner.

His fundamental aim is character-building; and he denies that any teaching of words, whether of history or religion, is worth much in character-building unless accompanied by the action that is inculcated in the lessons. This opinion has led him not only to add laboratories, gardens, kitchens, and workshops to the schools of Munich, but also to make these the central point in the instruction given in other lessons. Instead of beginning the work of the school with analysis of words and sounds, and drill in word and sentence formation, the child begins his school life with the observation of the things in the school, in the home, and on the street,

which form the basis of the oral and written language lessons, of the lessons in drawing and mathematics, and of the lessons in history and geography.

Books, of course, are soon introduced; but they are books that can be connected with the real life and interests of the child, that will illuminate and enlarge the instruction given in the school. From the time he or she starts school the boy or girl is regarded as an active living being and not as an automatic machine that registers things set down in books, to be committed to memory. Through observation lessons, through lessons in science and industry, the child throughout the grades is treated as an active being.

It was inevitable that a man holding such opinions should be dissatisfied with the *Allgemeine*, or General Continuation School, that was in existence in Munich when he took charge of the schools, and is still the common form of continuation school in Germany. Instruction in those schools was a mere repetition and enlargement of the bookish work of the elementary schools and had little interest for the youthful apprentices. He accordingly proposed a new program for the continuation school, the central point of which was the work of the shop. He believed that the trade was the center of interest for the young workman and therefore he introduced many different kinds of shops into the schools for apprentices, in which the typical processes of the various trades were carried on under the direction of competent workmen.

He connected the work in drawing, in mathematics, in civics — in fact, all of the work — with this shop practice. He believed that only in this way can apprentices become interested in the various subjects taught in the schools — only in this way can a genuine joy in the work of the school and shop be produced. He believed that dexterity must be based on insight; and if the boy is to become an efficient workman he must comprehend his work in all of its relations to science, to art, and to society in general. Efficiency in work will lead to joy in work and joy in work will lead to good citizenship. The young work-

man who understands his trade in its scientific relations, its historical, economic, and social bearings — who comprehends the inner connection that must exist in the work of all members of society — will take a higher view of his trade, of his powers and duties as a citizen and as a member of society. No instruction in what is commonly called civics, and no shop training that leads to mere mechanical efficiency, can make good citizens. The school must do the following things: First — It must teach skill in work and out of this joy in work; for true joy in work can grow only out of real capacity for work. Second — It must teach the student to use skill and joy in work in the service of his fellows. Third — It must teach insight into the aims of society and the state. Dexterity and insight demand moral character, for neither men nor industries nor states can live isolated lives.

Dr. Kerschensteiner lays down, as the first fundamental principle of the rightly organized continuation school, that it must extend to the eighteenth year of every boy and girl who is not being educated in the secondary school. He urges that the elementary school does not afford sufficient preparation for citizenship, as it leaves off just where the education for a calling begins. He points out that the struggle for life as well as for practical education begins with millions at the age of fourteen; that we cannot educate a man without reference to a special calling; that the useful man is the predecessor of the ideal man. To leave the youth at this most critical age without adequate educational opportunities to become an efficient and therefore a contented member of society is not the act of an educational statesman, and is most inconsistent with the philanthropic claims of modern school systems. The schools for the masses should not close where those for the favored few begin.

Dr. Kerschensteiner, as well as practically everybody else in Germany, is convinced that voluntary continuation schools will not suffice for the educational needs of modern society. Employers may not allow their youthful workmen to attend the continuation school unless it be in the evening, when both mind and body are too fatigued to

profit much by its instruction. Under such conditions the efficiency and joy in work, so necessary for training for citizenship, are out of the question and the boy soon learns to hate the continuation school. This means failure in our aim. Then, too, only the boy and girl with the exceptional physical and moral power will attend voluntary evening continuation schools. These are not the boys and girls who need its assistance most. There is, too, a tendency in voluntary continuation schools, even when held in the daytime, to limit the training too narrowly to the mechanical side of the trade. A large majority of the schoolmen of Germany demand compulsory continuation schools, carried on during weekdays, closing before seven o'clock in the evening. Most of the states of Germany already have them.

In 1900, the two city councils of Munich authorized the reorganization of the continuation schools in accordance with the principles laid down in Dr. Kerschensteiner's prize essay. His first step toward improving conditions was to connect practical industrial instruction with the trade and continuation schools. Thousands of boys have only a one-sided apprenticeship, and thousands more lack even this. He wished to inspire them through the delight that springs from thoroughness of work — to teach them to appreciate the moral effect of good work on their personalities. He urged that, if we make practical industrial training instead of textbooks and mere words the first form of instruction, we gain at once the interest and good-will of the pupils. There is then no difficulty in leading them to appreciate the allied branches of schoolwork — drawing, arithmetic, book-keeping, technology and knowledge of materials, tools and machinery. The interest aroused by practical work will be transmitted to all these allied subjects.

His second step was to enlist the active sympathy of employers and the trade guilds. He was assisted at the outset by the school workshops. The employers, seeing the apprentices taking an increasing interest in their work and finding them more efficient, gave the schools the credit for it. Dr. Kerschensteiner invited these associations

to inspect the schools, to advise regarding their progress, and to assist in the choice of foremen and journeymen as teachers. He also consulted their wishes as to time-tables and asked them to give their opinion regarding the course of study. In return, he was able to secure from them models, tools, machinery, and some raw materials. Through their interest in his schools he was able to secure attendance during a better part of the day and to put pressure upon the apprentices to take advantage of the classes.

His third step was regarding the time-tables. The quantity of work was increased to from seven to nine hours a week. The instruction of the apprentices on Sundays and in the evenings was given up. Every apprentice was compelled to attend a continuation school the whole time of his apprenticeship, or until he had reached his eighteenth year. The schools continued to give instruction on Sunday and in the evenings to masters and journeymen, but not to apprentices.

The reorganization has proceeded step by step, the whole plan of instruction receiving its present form in the course adopted in 1910. The courses of study were given a thorough-going examination and discussion by all the teaching bodies of the different industrial schools on the basis of the experience gained during the previous nine years. Forty-six of these conferences were held under the supervision of School Inspector Schmid, who has immediate charge of this part of the school work of Munich. The courses of study so discussed and the amendments recommended were then studied in forty-six further conferences, under the immediate supervision of Dr. Kerschensteiner. In these conferences the masters and journeymen of all the individual trades took part. Where an industrial union did not exist the most important employers of labor and representative journeymen of special trades were invited to the discussion. School Inspector Schmid and the directors and heads of departments of various industrial schools were also present. The present course of study is the result of these conferences and has the approval of teachers, employers, and employes.

Munich is a city of five hundred and eighty thousand inhabitants, with seventy thousand children in the elementary schools. The obligatory boys' continuation schools in 1909-10 enrolled about nine thousand pupils. The obligatory girls' continuation schools enrolled about seventy-five hundred. The voluntary girls' continuation schools, including the eighth grade classes for girls, enrolled thirty-six hundred pupils. Altogether there are about twenty thousand pupils in the continuation schools of Munich. If we add to this the number in the elementary schools, and about ten thousand pupils of the secondary schools of the city, we have one hundred thousand children who attend the public schools of Munich, about eighteen per cent of the population, and ninety-three per cent of all the boys and girls between the ages of six and eighteen. This is a remarkable showing.

The nine thousand boys in the obligatory continuation schools of Munich are distributed in fifty-two industrial or commercial continuation schools, studying forty-six different trades, and in twelve general continuation schools for boys who are not apprenticed to a trade. The seventy-five hundred girls in the obligatory continuation schools are divided into forty different schools and receive instruction in the household arts. Of the thirty-six hundred girls who attend the voluntary continuation schools, twelve hundred are in the eighth grade, thirteen hundred in the household arts division, nine hundred in commercial schools, and two hundred in other industries. They are instructed in twenty-one different schools. There are twenty-five hundred pupils in one hundred and thirty classes in the voluntary industrial schools for journeymen and masters.

Industrial continuation schools are introduced for every industry that has twenty apprentices. Industries having a greater number of apprentices are distributed in several schools in the city in order to shorten the distance the pupils have to travel. The twelve hundred commercial apprentices are, however, all instructed in a single building. The industrial continuation schools, together with the divisions

for journeymen and masters, are for the most part distributed in seven school buildings specially equipped for industrial and commercial education. One of these contains only boys engaged in commerce; another, the different branches of the decorators; a third, the different branches of the building trades; a fourth, the printing trades, the fine mechanics, and machinists; a fifth, the different branches of the woodworking trades. The school for butchers' apprentices is connected with the slaughter-house of the city, and the school for gardeners has its own building and equipment. Six of the fifty-two industrial continuation schools are carried on in elementary school buildings to avoid making the pupils travel too long a distance.

Every apprentice takes from his week's work one whole day or two half-days for the industrial continuation school. In some cases he does not lose his wages on this account. In most cases he does. These schools employ one hundred and ten regular teachers and three hundred teachers who devote a part of the time to other occupations. It is believed that there is an advantage in having shop teachers still connected with the industries outside.

The yearly expenditure for the continuation schools of Munich for apprentices and journeymen amounts to about nine hundred thousand marks, without considering the cost of the buildings. The expenditure for the corresponding continuation school for girls amounts to about four hundred thousand marks. Every continuation school pupil costs the city about eighty marks a year. The pupils in the regular elementary schools cost about ninety-three marks a year apiece; the pupils in the secondary schools about two hundred marks.

As has been pointed out, the practical instruction in the workshops, laboratories, kitchens, and gardens stands in the middle point of the instruction in every industrial continuation school. The instruction in drawing and arithmetic is united with the practical instruction in the closest possible way. Nothing is drawn that is not worked out in the workshop, and nothing is worked out or made in the work-

CONTINUATION SCHOOL FOR STUCCO WORKERS AND SCULPTORS

shop that is not drawn. The whole process of work is accompanied by arithmetical calculations, both in estimates of cost and in final settlements. With the practical instruction is united in the closest way the subject of the materials, tools, and machinery used in the industry. The pupils learn about these things through practical use. Where, however, the process of work makes a scientific knowledge of physics and chemistry necessary in order to enable the pupil to understand the reason for his methods of work, such special laboratory instruction in science is introduced. The lessons in the mother-tongue, together with the reading of good books from the school libraries and the instruction in civics, aim at the developing of moral insight. In his instruction in civics the student traces the historical development of the industry to which he belongs and is shown, in the struggles of his fellow-workers, the continually growing interdependence of all the citizens of a community. The great examples of devotion to a common cause are placed before him; and by degrees he recognizes the problems that cities and nations have to deal with and learns the rights and duties of the individual within the state. The association of the scholars into working groups, especially during the last school year, leads to a certain disposition in the pupils to consider others, to work together, and to devote themselves to a common purpose.

In Munich all young men engaged in commercial pursuits are obliged to attend a commercial continuation school unless they have completed a six years' course in a secondary school. Attendance is compulsory until the course is finished, or at least until the student has completed his eighteenth year. The course comprises three years' work, with a preparatory class for pupils whose acquirements are insufficient to enable them to profit by the regular instruction. The instruction is carried on for eight hours a week, every class having one forenoon period and one afternoon period of four hours each. The school runs from September fifteenth to July fourteenth, with two weeks' vacation during the Christmas time.

To make it possible to specialize, the pupils are divided into four groups, according to the branch of business followed by them. To the first group belong all those engaged in the food and provision business; to the second, those in banks and insurance offices, and booksellers; to the third, those handling drapery, textiles, leather, and the like; to the fourth, those in shops handling porcelain, cutlery, and hardware. This arrangement makes the work of conducting classes in bookkeeping and the study of commercial wares easier and more practical. Special commercial teachers are employed in giving purely commercial instruction, but specially trained teachers from the elementary schools do most of the teaching. The director of the school and several of his teachers have been in business, some of them still continuing their business connections while teaching a few hours a week. This enables them to keep in touch with what is going on in the business world.

In the middle point of the instruction stands the business. The various subjects are taught in the closest possible relation to business. Mathematics, business correspondence, bookkeeping, and study of wares, as well as civics, are treated in their relations to the business.

Only such mathematics is taught as can be related to the business, and much of it is taken from the transactions recorded in the bookkeeping or connected with exchange. The system of coinage used in Europe affords material for considerable arithmetical work. Calculations of interest, bills of exchange, stocks and securities, and so forth, call for constant practice in practical mathematics.

The customs and laws regulating the use of checks, bills of exchange, and accounts current are studied in bookkeeping. Practice is given in Italian, French, and American systems of bookkeeping. In connection with this there is constant practice in business correspondence, the materials being taken from the transactions recorded in the bookkeeping.

In connection with the study of commercial geography there is a careful study of commercial wares. These articles

are handled by the pupils where possible. In connection with this is a careful study of commerce and trade — both domestic and foreign — of transportation by land and sea, of the industrial productions and industrial efficiency of the various nations of the earth. The climate, productions, and industries of surrounding nations are studied. In the study of commercial wares their origin, their production, and their characteristics are taken up. The pupils are taught indications of genuineness and adulterations, and the methods of packing and preserving. In connection with this study, numerous visits are made to the factories and warehouses.

The course in hygiene is in general character the same as that given to other apprentices in the other trades, with such modifications in details as the trade makes necessary.

Drill in writing is given with a view to developing a plain, pleasing, and fluent handwriting. It affords an opportunity for drill in the use of foreign words and abbreviations, as well as in letter forms. Courses in foreign languages and in stenography are offered and are taken by a large number of pupils. The pupils write well, but very slowly. The writing is plain, with a slight slant. There was no vertical writing in evidence. The Germans have had their experience with vertical writing and have got over it. There was no drill in movement and no pupils employing what we in America call the muscular movement.

I was especially interested in the two classes I saw in the study of commercial wares. These recitations are held in rooms containing collections of commercial wares furnished by the merchants of Munich. On the walls are numerous charts, picturing the processes employed in producing the various articles of commerce, and cases containing articles of commerce were in evidence.

The first class was studying wool. About thirty boys, under the direction of a teacher who was in the textile business, were examining some ten or twelve samples of wool produced in different countries. In front of the class were charts showing the structure of the fiber and methods of preparing it for the market. The teacher divided the

class into groups, giving each group samples of wool. The pupils were taught how to discriminate between them. The mercantile value of the different wools was discussed and samples of cloth — all wool, part wool, and shoddy — were examined. The importance of this industry to Germany was pointed out and a short history of the woolen industry was given by the teacher.

I took pains to consult union men, business men, and teachers, and found that the pupils and working men and most of the employers approve of the work of the continuation school. The conservative class are against them and have fought Dr. Kerschensteiner's measures for years. They object to the expense. They regard his shopwork as inadequate and say that the few hours spent a week in a school-shop cannot be made the center of the entire course of instruction. In some quarters, too, one can hear criticisms of his civics work as apt to lead to Social Democracy. He pays no attention in his lessons to the question of "the dynasty," or to the union of church and state. He claims that his teaching will make good citizens of any rational state. At the present moment a commission is in existence to examine the schools of Munich on account of charges made by the conservatives against them. It is very unlikely that anything serious can result from this investigation. The Doctor and his friends welcome investigation.

The "system of Kerschensteiner," as it is called in Germany and Switzerland, comes in for considerable criticism from the schoolmen there. They, too, claim it is too expensive; that his teachers are not always well trained; that in his anxiety for results he has advanced too rapidly and has got into his schools many teachers who will be a burden later. It is urged, too, that the attempt to base the whole teaching of the continuation school on the shopwork done in them is unwise and will result in poor preparation for the industries. They claim that the whole theory of the trade must be taught and the school-shops used to supplement the work of the master, and to illustrate the other work of the school. I

think some of the criticisms result from lack of thorough acquaintance with his plans.

### Continuation Schools with Full-day Instruction

There are day continuation schools in Bavaria and a similarly organized day school in Aachen, and a commercial and industrial school in Gniessen, which must be mentioned in this connection. These schools aim to provide education before entrance into apprenticeship suited to the needs of industrial life. They differ from the ordinary continuation school in that they admit pupils before their entrance into apprenticeship, and demand their entire time for their school education, excluding work in the workshop of the master; they differ from purely technical schools in paying more attention to general cultural subjects.

The course of instruction comprises from twenty-five to thirty-four hours per week during the one or two years' course. The subjects included are: religion, geography, bookkeeping, arithmetic, natural science, history, drawing; in special cases turning, geometry, French, stenography, and music; special courses in voluntary subjects are sometimes included.

There are sixteen of these day continuation schools in Bavaria, with about five hundred pupils. Students are admitted after finishing six years in the elementary school course; they are, therefore about twelve years of age; but they must pass an examination before admission. The one year course day continuation school replaces accordingly the seventh year of the elementary school; while the two year day continuation school replaces both the seventh and eighth years. Apprentice continuation schools and drawing schools for handicraftsmen are united with these special institutions.

The schools of Aachen and Gniessen differ from the Bavarian schools in accepting only pupils who have already completed their compulsory education in the elementary school. This regulation is made to prevent shortening the present elementary instruction, and to secure pupils better developed bodily and mentally.

These schools seem to be successful, as many people believe that their preparation of young people is preferable to that given in the master's shop and in the ordinary continuation school. Students finishing these courses have their usual apprenticeship shortened, as these partly trained boys are of use to the master from the very beginning. The schools do not, however, seem to be increasing in number or popularity.

It should be noticed that these schools do not include workshop instruction where students are made acquainted with the most useful tools and machinery, and where they acquire some skill in their use. The instruction is almost purely theoretical. It is not intended to replace apprenticeship, but to give further preparation for it with the hope of turning out finally a better all-round workman.

### Advanced Continuation Schools

The continuation school is not only a school for youth between fourteen and eighteen years old or during their apprenticeship, but is a school for journeymen, and even masters. A large number of such advanced continuation schools exist in Germany, and are exceedingly popular. Dr. Kerschensteiner has, perhaps, carried out the development of such advanced continuation schools better than anyone else. Similar continuation schools are, however, organized in connection with the school systems of all the great cities of Germany. These continuation schools enable young people who seek further education in their trade, but cannot make the pecuniary sacrifices required for attendance at a technical school, to go as far as their ability will permit them. They are a kind of industrial academy in which every young man — according to his needs and inclinations — can select those studies for which he has special need. He can here perfect himself in commercial and technical subjects required for passing the masters' examination. The schools, of course, are voluntary, and great liberty is given students in the matter of selecting the subjects pursued.

## Statistics

The vocation census of 1907 made it possible to determine the number of youths between the ages of fourteen and eighteen years. It also made possible an estimate of their division according to place, sex, and branch of industry.

There are in Prussia about three million youths between fourteen and eighteen years of age, of whom one million four hundred and eighty-three thousand are males and one million five hundred and twenty-seven thousand females. Of this number, about two million are employed in a vocation—one and a quarter million males and three-quarters of a million females. Agriculture employs four hundred and five thousand males, four hundred and nine thousand females, industry six hundred and fifty thousand males, one hundred and ninety-one thousand females, commerce and trade one hundred and fourteen thousand males, sixty-seven thousand females. The number of females between fourteen and eighteen employed in agriculture is greater than the number of males of the same ages; about half as many females are employed in commerce and about one quarter in industry. Of young people between these ages there are employed in activities requiring a special training:

(*a*) In the industries, 451,000 men and 91,000 women.

(*b*) In commerce, 63,000 men and 35,000 women.

The number of unskilled male workers between these ages in the industries amounts to thirty-one per cent, in commerce forty-four per cent, while the unskilled female workers between these ages in the industries amount to fifty-two per cent, in commerce forty-eight per cent. It is impossible to say anything definite about the kind and duration of training received by these young persons. The showing for the females would be still more unfavorable if a systematic training of at least one year was taken as a standard of measurement.

It is estimated that there were in Prussia in 1907 300,000 apprentices in the handicrafts. Remembering

that there are 451,000 boy workers in the industries who receive special training for their work, these figures would show that two-thirds of the skilled boy workmen were in the handicrafts and one-third in the factories. Statistics show that about forty-one per cent of the boy workers in Prussia do not attend a continuation school. The percentage of girls who do not attend is very much greater. The introduction of compulsion has been gradually increasing the percentage who attend, but this applies only to the larger places. The proposed new law will doubtless increase the percentage still more, but it seems probable that it will be a long time before universal compulsory instruction will be provided for boys and girls between these ages.

The following statistics will give some information concerning the continuation schools in the more important divisions of Germany. It is impossible to give absolutely accurate statistics for all of the states, but the five selected will give a fairly accurate showing of the situation.

CONTINUATION SCHOOL FOR PLUMBERS, MUNICH

## The Present Condition of the German System of Continuation Schools

### 1. Prussia

#### (a) Industrial and Commercial Continuation Schools

By order of the Prussian Ministry, every year on the first of December a careful survey of the conditions of the industrial and commercial continuation schools is prepared and published in the report of the Ministry of Commerce and Industry. The 1908 report shows the following figures on the development of the above named schools:

NUMBER OF SCHOOLS

| | Industrial Schools | | | Commercial Schools | | | Guild and Union Schools |
|---|---|---|---|---|---|---|---|
| | With Compulsory Attendance | Without Compulsory Attendance | Total | With Compulsory Attendance | Without Compulsory Attendance | Total | |
| 1904 | 1183 | 107 | 1290 | 221 | 69 | 290 | 428 |
| 1905 | 1301 | 94 | 1395 | 254 | 62 | 316 | 423 |
| 1906 | 1450 | 85 | 1535 | 276 | 58 | 334 | 409 |
| 1907 | 1537 | 74 | 1611 | 299 | 58 | 357 | 403 |
| 1908 | 1651 | 68 | 1719 | 327 | 54 | 381 | 402 |

NUMBER OF PUPILS

| | Industrial Schools | | | Commercial Schools | | | | | | | Guild and Union Schools |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | With Compulsory Attendance | Without Compulsory Attendance | Total | With Compulsory Attendance | | | Without Compulsory Attendance | | | Total | |
| | | | | Men | Women | Total | Men | Women | Tot'l | | |
| 1904 | 174494 | 27222 | 201716 | ..... | .... | 22603 | .... | .... | 9067 | 31670 | 28043 |
| 1905 | 202669 | 23905 | 226574 | 27181 | 927 | 28108 | 7208 | 1618 | 8826 | 36934 | 28124 |
| 1906 | 240951 | 20390 | 261341 | 29954 | 1240 | 31194 | 6655 | 1982 | 8637 | 39831 | 25728 |
| 1907 | 265979 | 18588 | 284567 | 34179 | 1842 | 36021 | 5811 | 1752 | 7563 | 43584 | 24351 |
| 1908 | 286822 | 17659 | 304481 | 36847 | 2693 | 39540 | 6262 | 1929 | 8191 | 47731 | 22168 |

NUMBER OF PUPILS—*Continued.*

| Provinces | Industrial Schools | | | Commercial Schools | | | |
|---|---|---|---|---|---|---|---|
| | Total No. | Number Receiving State Aid | Number Pupils | Total No. | No. Receiving State Aid | Number Pupils | |
| | | | | | | Men | Women |
| East Prussia.....*a* | 67 | 59 | 9,072 | 19 | 13 | 1,544 | 409 |
| West Prussia.....*a* | 52 | 52 | 12,543 | 8 | 8 | 541 | .... |
| Pomerania .....*a* | 66 | 65 | 6,547 | 14 | 8 | 706 | 69 |
| Pomerania .....*b* | 6 | 1 | 726 | 7 | ... | 290 | 23 |
| Brandenburg without Berlin.....*a* | 93 | 86 | 23,906 | 44 | 10 | 2,676 | 289 |
| Berlin.....*a* | 10 | ... | 30,392 | 1 | ... | 2,088 | ... |
| Berlin.....*b* | 15 | ... | 8,140 | 1 | ... | 1,693 | 736 |
| Posen.....*a* | 81 | 81 | 9,190 | 16 | 16 | 1,250 | 128 |
| Silesia.....*a* | 179 | 167 | 34,264 | 74 | 50 | 6,974 | 482 |
| Silesia.....*b* | 4 | 1 | 885 | 5 | 1 | 161 | 214 |
| Saxony.....*a* | 140 | 137 | 27,328 | 33 | 27 | 5,312 | 113 |
| Saxony.....*b* | ... | ... | ..... | 6 | 2 | 252 | 131 |
| Schleswig-Holstein...*a* | 90 | 79 | 11,983 | 11 | 5 | 968 | ... |
| Schleswig-Holstein...*b* | 6 | ... | 742 | 4 | 1 | 477 | 104 |
| Hannover.....*a* | 198 | 189 | 19,962 | 35 | 17 | 3,140 | 101 |
| Hannover.....*b* | 7 | 2 | 336 | 8 | .. | 518 | ... |
| Westphalia.....*a* | 206 | 180 | 29,657 | 31 | 23 | 3,885 | 365 |
| Westphalia.....*b* | 2 | ... | 68 | 11 | 4 | 1,071 | 152 |
| Hesse-Nassau.....*a* | 211 | 204 | 22,481 | 11 | 6 | 1,530 | 467 |
| Hesse-Nassau.....*b* | ... | ... | ..... | 1 | ... | 550 | .... |
| Rhine-province.....*a* | 198 | 191 | 44,354 | 30 | 27 | 6,233 | 270 |
| Rhine-province.....*b* | 28 | 14 | 6,762 | 11 | 4 | 1,250 | 569 |
| Sigmaringen.....*a* | 6 | 6 | 410 | ... | ... | .... | .... |
| Totals.....*a* | 1,597 | 1,496 | 281,081 | 327 | 210 | 36,847 | 2,693 |
| Totals.....*b* | 68 | 18 | 17,659 | 54 | 12 | 6,262 | 1,929 |
| Grand Total..... | 1,665 | 1,514 | 298,740 | 381 | 222 | 43,109 | 4,622 |

(*a*) With compulsory attendance. (*b*) Without compulsory attendance.

The 402 schools of guilds and unions which existed on the first of December, 1908, are distributed among the organizations as follows:

| | |
|---|---|
| Barbers and hair-dressers | 92 schools |
| Blacksmiths, locksmiths, carriage-makers | 61 " |
| Painters and varnishers | 44 " |
| Bakers and confectioners | 18 " |
| Stonecutters and building-trades men | 14 " |
| Butchers | 8 " |
| Saddlers and upholsterers | 7 " |
| Shoemakers and carpenters | 5 " |

Chimney-sweeps..... 4 schools
Coopers, bookbinders, glaziers, each..... 3 "
Book-printers, wood and metal handworkers, tinners, tailors, potters, watchmakers, each... 2 "
Turners, hotel-keepers, basket-makers, stone-masons, each..... 1 "

The united free handicraft guilds and the mixed guilds support about thirty-eight schools.

Those continuation schools are to be counted as industrial continuation schools which are organized by the owners of great industries for their youthful workers, and bear, according to the direction of the Ministry, the descriptive term "Werkschulen." On the eighteenth of December, 1908, 54 such schools, with 57,141 pupils, existed in Prussia. They are divided as follows by government districts:

| | | | |
|---|---|---|---|
| Oppeln..... | 15 schools | Hildesheim..... | 2 schools |
| Merseburg..... | 14 " | Berlin..... | 1 " |
| Trier..... | 8 " | Cassel..... | 1 " |
| Düsseldorf..... | 5 " | Frankfurt..... | 1 " |
| Liegnitz..... | 3 " | Osnabrück..... | 1 " |
| Arnsberg..... | 2 " | Stettin..... | 1 " |

These "Werkschulen" are recognized by the official authorities as a substitute for the compulsory continuation school.

The following table shows the hours of instruction, according to conditions on December 1, 1908:

| Kinds of Schools | No. of Pupils | Time the Pupils have Instruction | | | | Number of Hours | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sunday A. M. | Before 8 P. M. | Also after 8 P. M. | Only after 8 P. M. | Entire No. of Hours | Sunday | Before 8 P. M. | After 8 P. M. |
| Industrial continuation schools..... | 2,169 | 1,075 | 1,396 | 609 | 64 | 60,648 | 6,747 | 46,455 | 7,446 |
| | .... | 50% | 64% | 28% | 3% | .... | 11% | 77% | 12% |
| Commercial continuation schools..... | 392 | 36 | 219 | 130 | 38 | 14,232 | 193 | 11,335 | 2,704 |
| | ... | 9% | 56% | 33% | 10% | .... | 1% | 80% | 19% |

In the same way the number of teachers employed in the continuation schools is also constantly growing. The official figures are as follows:

NUMBER OF TEACHERS

| | In Industrial Continuation Schools | | | In Commercial Continuation Schools | | | In Guild and Union Schools | | |
|---|---|---|---|---|---|---|---|---|---|
| | Full Time | Part Time | Total | Full Time | Part Time | Total | Full Time | Part Time | Total |
| 1904..... | 94 | 9,624 | 9,718 | 64 | 1,735 | 1,799 | 6 | 1,514 | 1,520 |
| 1906..... | 199 | 12,161 | 12,360 | 138 | 2,063 | 2,201 | 16 | 1,476 | 1,492 |
| 1908..... | 331 | 13,712 | 14,043 | 206 | 2,272 | 2,478 | 12 | 1,377 | 1,389 |
| Changes since 1904..... | 252% gain | 42% gain | 44% gain | 222% gain | 31% gain | 38% gain | 100% gain | 9% loss | 9% loss |

REGULAR VOCATIONS OF PERSONS EMPLOYED AS TEACHERS

| | Industrial Continuation Schools | | | Commercial Continuation Schools | | | Schools of Guilds and Unions | | |
|---|---|---|---|---|---|---|---|---|---|
| | Teachers | Handicraftsmen | Others | Teachers | Handicraftsmen | Others | Teachers | Handicraftsmen | Others |
| 1904..... | 8,532 | 516 | 670 | 1,613 | 147 | 39 | 607 | 691 | 222 |
| 1906..... | 10,732 | 644 | 984 | 1,997 | 142 | 62 | 567 | 660 | 265 |
| 1908..... | 12,068 | 753 | 1,222 | 2,287 | 136 | 55 | 469 | 697 | 223 |
| Changes since 1904..... | 41% gain | 46% gain | 82% gain | 41% gain | 8% loss | 41% gain | 23% loss | 1% gain | |

With reference to the change in the vocations of the teachers which has taken place from December 1, 1904, to December 1, 1906, the official report of the National Industrial Commission of Prussia contains the following statement: "While the number of teachers belonging to the teaching and the handicraft classes has increased at the same rate, about 26 per cent, the number of teachers belonging to other professions (draftsmen, technicians, engineers) has increased at almost twice that rate (48 per cent), an indication of the stronger emphasis laid on vocational teaching. The increasing tendency to confine the schools of guilds and unions to technical instruction shows itself in the decrease in the number of instructors who are teachers by profession. The conspicuously small number of commercial people giving instruction in the commercial continuation schools is explained by the fact that these schools are steadily going over to day-school instruction, and this makes it impossible for merchants to teach in them and at the same time conduct their own business."

The figures for 1908 show that the industrial department of the school system of Prussia has made a marked advance in the past two years. The number of practical men who give instruction in the industrial continuation schools of the district of Wiesbaden is extraordinarily great. This is due to the activity of the industrial unions of Nassau, which for the last ten years have warmly encouraged the industrial continuation schools. In the school year 1908–9, in additional to 433 professional teachers, there were 91 craftsmen and 89 technical men — architects, engineers, and merchants — giving instruction in 144 industrial continuation schools conducted under the direction of the executive committee of the industrial unions.

The following survey shows the amount of the State grants for the industrial continuation and commercial continuation schools for boys, from 1905 to 1908:

| Years | Industrial Continuation Schools | | | Commercial Continuation Schools | | | Guild and Union Schools | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. of Schools | No. of State-assisted Schools | Maximum State Grant | No. of Schools | No. of State-assisted Schools | Maximum State Grant | No. of Schools | No. of State-assisted Schools | Maximum State Grant |
| 1905 | 1345 | 1209 | 1589180M. | 316 | 158 | 120921M. | 423 | 89 | 26375M. |
| 1906 | 1535 | 1324 | 1890923M. | 334 | 179 | 139127M. | 409 | 98 | 25469M. |
| 1907 | 1611 | 1420 | 2060255M. | 357 | 201 | 147725M. | 403 | .. | 24529M. |
| 1908 | 1719 | 1514 | 2232209M. | 381 | 222 | 169978M. | 402 | .. | 26453M. |

A comparison of the State grants with the amounts contributed from other sources for the support of industrial continuation schools is given in the following table, which is taken from the third report of the National Industrial Commission of Prussia, for the year 1909:

SOURCES OF REVENUE

| Kinds of Schools | Entire Cost | Tuition Fees | Amount contributed by Unions, Guilds, Commercial Associations, Districts, etc. | Local Tax | State Grant |
|---|---|---|---|---|---|
| Industrial continuation schools... | 7309300M. ..... | 636104M. 9% | 159520M. 2% | 3732307M. 51% | 2781369M. 38% |
| Commercial continuation schools | 1452884M. .... | 778704M. 54% | 190228M. 13% | 245050M. 17% | 238902M. 16% |

## (B) Country Continuation Schools

The development of the country continuation school system during the last five years is shown by these figures:

| Winter Half-Year | Continuation Schools without Technical Instruction | | | Continuation Schools with Experimental Stations for Technical Instruction | | |
|---|---|---|---|---|---|---|
| | No. of Schools | No. of Pupils | Total Expense in Marks[1] | No. of Schools | No. of Pupils | Total Expense in Marks[1] |
| 1904–05 | 2,019 | 28,333 | 231,024 | 6 | 84 | 1,235 |
| 1905–06 | 2,617 | 37,445 | 334,706 | 6 | 100 | 1,412 |
| 1906–07 | 2,991 | 42,607 | 432,553 | 7 | 84 | 1,557 |
| 1907–08 | 3,477 | 50,858 | 532,932 | 8 | 161 | 1,800 |
| 1908–09 | 3,781 | 55,889 | 574,102 | 7 | 171 | 1,906 |

[1] This is exclusive of the cost of heating, lighting, and cleaning the schools.

The following table shows the distribution of country continuation schools over different provinces, and the sources of the revenue of these schools, for the year 1908–9:

| Provinces | Built by | | | | | Cost of Maintenance Borne by | | | | | No. of Schools Compared with 1907 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total No. | Districts | Communities | Associations | Individuals | Districts | Communities | State | State and Other Agencies | Individuals | Gain | Loss |
| East Prussia | 527 | 2 | 192 | 11 | 322 | .. | .. | 420 | 107 | .. | 53 | .. |
| West Prussia | 106 | 18 | 12 | .. | 76 | .. | 2 | 100 | 4 | .. | 8 | .. |
| Brandenburg | 174 | .. | 84 | 2 | 88 | .. | .. | .. | 173 | 1 | .. | .. |
| Pomerania | 123 | .. | 94 | .. | 29 | .. | .. | .. | 122 | 1 | 21 | .. |
| Posen | 334 | .. | 156 | .. | 178 | .. | .. | 296 | 38 | .. | 62 | .. |
| Silesia | 394 | 26 | 84 | 1 | 283 | 2 | 1 | 265 | 121 | 5 | 58 | .. |
| Saxony | 113 | .. | 87 | 1 | 25 | 2 | 1 | .. | 99 | 10 | .. | .. |
| Schleswig-Holstein | 202 | .. | 32 | 25 | 145 | .. | .. | 81 | 119 | 2 | .. | 10 |
| Hannover | 472 | 70 | 305 | 14 | 83 | 10 | 1 | .. | 449 | 12 | 20 | .. |
| Westphalia | 236 | 1 | 224 | 10 | 1 | 5 | 4 | .. | 217 | 10 | 6 | .. |
| Hesse-Nassau | 730 | .. | 730 | .. | .. | .. | 5 | .. | 705 | 20 | 73 | .. |
| Rhine-province | 316 | .. | 280 | 1 | 35 | .. | 2 | .. | 277 | 37 | 12 | .. |
| Hohenzollern | 54 | .. | 54 | .. | .. | .. | .. | .. | 54 | .. | 1 | .. |

Hesse-Nassau accordingly stands in the first place among all the provinces, with 730 schools. Among these 730 schools there are 687 with compulsory attendance, based on the law of August 8, 1904. The number of compulsory schools increased from 1907–8 about 130, while the number of

schools with voluntary attendance decreased during the same time about 57. The seven schools organized with investigating stations for technical instruction are not contained in this summary. They are found generally in the district of Oppeln, and are supported by the State without contributions from any other source.

The following table shows the number of pupils and teachers, as well as the length of courses, as they were in the winter half-year of 1908:

| Provinces | Entire No. of Pupils | Number of Schools in which there were: | | | Entire No. of Teachers | Of the Teachers there were: | | | No. of Schools having: | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Up to 10 Pupils | 11 to 20 Pupils | Over 20 Pupils | | Clergymen | Elementary School Teachers | Other Persons | Winter Courses | Whole Year Courses |
| East Prussia | 4692 | 416 | 100 | 11 | 679 | 6 | 672 | 1 | 521 | 6 |
| West Prussia | 1037 | 65 | 40 | 1 | 120 | .. | 119 | 1 | 101 | 5 |
| Brandenburg | 1926 | 103 | 57 | 14 | 259 | 30 | 229 | .. | 173 | 1 |
| Pomerania | 1579 | 57 | 53 | 13 | 185 | 19 | 166 | .. | 122 | 1 |
| Posen | 3866 | 170 | 153 | 11 | 375 | 1 | 374 | .. | 334 | .. |
| Silesia | 8084 | 53 | 178 | 163 | 532 | 8 | 522 | 2 | 390 | 4 |
| Saxony | 1648 | 40 | 54 | 19 | 184 | 24 | 153 | 7 | 113 | .. |
| Schleswig-Holstein | 2797 | 149 | 37 | 16 | 283 | 7 | 267 | 9 | 201 | 1 |
| Hannover | 6685 | 181 | 221 | 70 | 744 | 42 | 689 | 13 | 470 | 2 |
| Westphalia | 4086 | 51 | 120 | 65 | 371 | 27 | 334 | 10 | 238 | 3 |
| Hesse-Nassau | 12944 | 208 | 327 | 195 | 1026 | 11 | 1015 | .. | 730 | .. |
| Rhine-province | 6020 | 62 | 161 | 93 | 406 | 15 | 386 | 5 | 288 | 28 |
| Hohenzollern | 525 | 31 | 20 | 3 | 79 | .. | 79 | .. | 53 | 1 |

The funds for the country continuation schools without technical instruction were obtained as follows:

| | | Fiscal Year 1907 | Fiscal Year 1908 |
|---|---|---|---|
| From | tuition | 28,647 Mk. | 29,288 Mk. |
| " | associations other than agricultural | 31,441 Mk. | 28,481 Mk. |
| " | agricultural associations | 3,144 Mk. | 2,778 Mk. |
| " | community | 66,542 Mk. | 69,209 Mk. |
| " | districts | 54,767 Mk. | 60,701 Mk. |
| " | Provinces | 7,787 Mk. | 6,557 Mk. |
| " | the State | 340,604 Mk. | 377,088 Mk. |

### (c) Continuation Schools for Girls

The schools of Prussia for the further instruction of girls are of so many different forms that it is difficult to give an adequate statistical survey. An important reason for this is that the continuation schools for girls have generally been established and maintained by private individuals and unions. According to a report of the Ministry of Commerce and Industry, there were in the winter of 1908–9, outside of the commercial continuation schools, 106 State or State-assisted technical and continuation schools for girls. These included:

I. State institutions:
   (*a*) The Royal Commercial and Industrial Schools for girls at Posen, Potsdam, and Rheydt..... 3
   (*b*) The Royal Embroidery Schools in the governmental districts of Breslau and Liegnitz..... 7

II. State-assisted institutions:
   (*a*) Combined commercial and industrial schools.... 8
   (*b*) Commercial schools..... 11
   (*c*) Industrial schools with instruction in cooking and household work, the making of undergarments, tailoring, drawing, etc..... 70
   (*d*) Lace-making schools..... 3
   (*e*) Glove-making schools..... 3
   (*f*) Artistic embroidery schools..... 1

This table will give a general view of the situation. In individual cases various institutions are placed together in one group, especially under II (*c*), and even schools with the same designation are very dissimilar in their educational aims. The State grants for the girls' schools under the industrial authorities amounted in the year 1908 to 465,248 Mk.

Exact figures are not available for the girls' continuation schools that do not receive State aid. To this group belong, for example, ten institutions which are supported by the city of Berlin.

CONTINUATION SCHOOL FOR CABINET MAKERS, MUNICH

## 2. Bavaria

In Bavaria young people leaving the elementary school must, according to the school regulations of June 4, 1903, attend a Sunday school up to the completion of their sixteenth year. In the school year 1907–8, 295,901 pupils were in attendance at the Sunday schools. Of these, 73,416, or 24.8 per cent, were in the cities and 222,485, or 75.2 per cent, were in the country. The number of boys was 122,952, or 41.6 per cent; the number of girls 172,949, or 58.4 per cent. Attendance at a continuation school may be substituted for attendance at a Sunday school, though in some communities the authorities require attendance at a special continuation school, in addition to this Sunday attendance.

The vocational continuation schools are organized into industrial, commercial, and agricultural continuation schools. The following series of tables, taken from the official report, show the development and the present situation of these different departments:

1. (*a*) Development of the industrial continuation schools in the five years between 1903–1908:

| Year | Number of Schools | Number of Courses | Number of Pupils | Number of Teachers | Amount Expended Marks | Average Amount per Pupil Marks |
|---|---|---|---|---|---|---|
| 1903–4 | 301 | 1,511 | 41,253 | 2,403 | 912,118 | 21.1 |
| 1904–5 | 328 | 1,663 | 45,202 | 2,488 | 1,035,305 | 22.9 |
| 1905–6 | 323 | 1,725 | 45,399 | 2,622 | 1,269,189 | 27.9 |
| 1906–7 | 340 | 1,917 | 51,277 | 2,771 | 1,523,681 | 29.7 |
| 1907–8 | 347 | 2,008 | 54,774 | 2,812 | 1,765,981 | 32.2 |

(*b*) Condition of the industrial continuation schools at the end of the school year 1907–8:

| Governmental Districts | No. of Schools | No. of Schools with Compulsory Courses | The Continuation School Includes: | | | Number of Pupils | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Day Continuation Courses | Evening and Sunday Courses | | In Day Continuation Courses | In Evening and Sunday Courses | | Total |
| | | | | Elementary Division | Technical Division | | Elementary Division | Technical Division | |
| Upper Bavaria.. | 70 | 65 | 6 | 190 | 459 | 159 | 5069 | 9170 | 13689 |
| Lower Bavaria.. | 30 | 24 | 2 | 48 | 15 | 18 | 1394 | 543 | 1924 |
| Pfalz ..... | 28 | 24 | 3 | 91 | 133 | 18 | 2975 | 4329 | 7282 |
| Upper Pfalz .... | 40 | 35 | 3 | 56 | 65 | 44 | 1699 | 1884 | 3331 |
| Upper Franconia | 35 | 30 | .. | 99 | 80 | .. | 3705 | 3163 | 6812 |
| Middle Franconia ..... | 32 | 30 | .. | 340 | 74 | .. | 10004 | 1654 | 11385 |
| Lower Franconia | 65 | 52 | .. | 123 | 40 | .. | 3955 | 1254 | 5209 |
| Suabia..... | 47 | 36 | 16 | 145 | 15 | 318 | 4359 | 418 | 5095 |
| Entire Kingdom | 347 | 296 | 30 | 1097 | 881 | 557 | 33160 | 22415 | 54777 |

Forty-four of the 347 industrial continuation schools were united with Realschulen. The other schools were independent institutions, sixteen of them being the so-called day continuation schools.

II. Schools for commercial instruction, year 1907–8:

| Kinds of Schools | Total No. of Schools | Public | Private | No. of Courses | Number of Pupils | | |
|---|---|---|---|---|---|---|---|
| | | | | | Boys | Girls | Total |
| Public commercial schools... | 6 | 6 | .. | 44 | 503 | 976 | 1479 |
| Commercial department of the six class Realschulen .. | 31 | 31 | .. | 93 | 1022 | .. | 1022 |
| Commercial industrial continuation schools as parts of the Realschulen..... | 11 | 11 | .. | 45 | 1009 | 37 | 1046 |
| Independent commercial industrial continuation schools and other commercial technical schools... | 16 | 12 | 4 | 83 | 2298 | 184 | 2482 |
| Private commercial schools.. | 12 | .. | 12 | 69 | 1468 | 195 | 1663 |

III. Agricultural continuation schools for five years between 1903–1908:

| Year | Agricultural Winter Schools | | | | Agricultural Continuation Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of | | Expenditures | | Number of | | Expenditures | |
| | Schools | Pupils | Marks | Average per pupil | Schools | Pupils | Marks | Average per pupil |
| 1903–4 | 37 | 1,385 | 281,800 | 203.5M | 387 | 7524 | 52,500 | 7.0M. |
| 1904–5 | 39 | 1,421 | 292,500 | 205.8M | 389 | 7513 | 52,200 | 6.9M. |
| 1905–6 | 40 | 1,452 | 302,700 | 208.4M | 390 | 7351 | 50,700 | 6.9M. |
| 1906–7 | 41 | 1,553 | 320,400 | 206.3M | 362 | 6341 | 46,900 | 6.8M. |
| 1907–8 | 41 | 1,604 | 278,900 | 173.9M | 345 | 6616 | 46,700 | 7.0M. |

IV. Vocations of the teachers, year 1907–1908:

| Kinds of Schools | Number of | | | | Total Number of Teachers |
|---|---|---|---|---|---|
| | Full-time Teachers | Real-schulen Teachers | Elementary School Teachers | Belonging to other Callings | |
| Industrial continuation schools | 108 | 210 | 1,953 | 541 | 2,812 |
| Agricultural continuation schools | ... | ... | 435 | 5 | 440 |
| Agricultural winter schools. | 78 | 16 | 104 | 222 | 420 |

V. The expenses of the industrial and agricultural continuation schools and the agricultural winter schools, outside the expense of heating, lighting, and cleaning the school buildings, were defrayed as follows in the year 1907-1908:

| | For Industrial Continuation Schools | For Agricultural Continuation Schools | For Agricultural Winter Schools |
|---|---|---|---|
| By communities | 880,555 marks | 5,631 marks | 3,545 marks |
| By small districts | 20,660 " | 9,777 " | 41,474 " |
| By larger districts | 602,226 " | 19,582 " | 131,788 " |
| By the State | 106,329 " | 9,780 " | 13,455 " |
| By other agencies | 82,063 " | 1,952 " | 49,296 " |

Outside of the above named institutions, the Bavarian schools for women's work had 4,471 pupils in 1907–1908. Among these institutions there are three public schools which, for the most part, are undertakings of numerous associations of women. Finally, there were in that year 170

lower technical schools, organized by the industrial and handicraft unions, guilds, commercial unions, or private individuals, with 6,686 male and 5,036 female pupils. The course includes the subjects of drawing, stenography, and other commercial subjects, cooking, housekeeping, etc. Of these institutions 39 were public and 131 private schools.

### 3. Saxony

In Saxony the boys leaving the elementary school are obliged by law to attend a general continuation school. The community determines whether the girls shall be obliged to attend the continuation school or not. In the year 1909 an inquiry was made by the statistical committee of the Saxon association of teachers, and it was found that continuation schools for boys and men were maintained in 1,886 places, and for girls and women in seven places. In thirty-two cases a continuation school was maintained jointly by two communities, and in two cases by three. In 1,865 places the boys were obliged to attend school three years, in twenty places two years, and in one place part of the pupils three years and another part of the pupils two years.

| | | |
|---|---|---|
| The instruction extended throughout: | | |
| The entire year in | 1,028 | places |
| The winter half-year in | 802 | " |
| The months from October to June in | 53 | " |
| The whole year for the handicraftsmen and throughout the winter half-year for the other pupils in | 3 | " |
| The hours of instruction were: | | |
| On Sunday in | 23 | " |
| On weekdays and Sunday in | 31 | " |
| On weekdays alone in | 1,830 | " |
| On Sunday in summer and weekdays in winter in | 2 | " |
| The weekday instruction took place: | | |
| In the hours before seven in the evening in | 1,218 | " |
| In the hours after seven in the evening in | 62 | " |
| In day and evening hours in | 575 | " |

Vocational classes existed in 216 places. Outside of the classes for the pupils employed in the industries, there were classes for merchants in eighteen places, classes for clerks in ten places, and classes for farmers in sixty-five places.

Besides German and mathematics, the following subjects of instruction were carried on:

| | | |
|---|---|---|
| Information about the vocation in..... | 803 | places |
| Bookkeeping and exchange in..... | 314 | " |
| Civics (principles of law and economics) in | 484 | " |
| Science in..... | 326 | " |
| Drawing in..... | 114 | " |
| Stenography in..... | 21 | " |

No tuition was paid in 915 places. In the remaining places the tuition varied from 75 pfennigs to 8 marks. In two places the tuition amounted to more than 8 marks.

In addition to the general continuation schools there are a great number of vocational schools in Saxony which cannot be classed as real continuation schools, as they have in part a higher aim. Fifty-six of these institutions are called continuation schools. The number with compulsory attendance is quite small — about ten. The pupils receive on the average six hours of instruction per week during the two or three years' course. Of these industrial continuation schools sixteen have been founded by communities, twenty-seven by unions, five by guilds, and two by owners of industrial plants. Most of the technical schools founded by the guilds and a few of the lower technical schools founded for apprentices by the unions and by the communities are to be considered as industrial continuation schools. Of the fifty-six schools of this kind, twenty-one limit themselves to the purely practical instruction of apprentices; while the remaining thirty-five, in addition to this, give instruction in German, mathematics, principles of industry, bookkeeping, etc. The limitation to practical instruction is found principally in the guild schools for barbers, hair-dressers, and wigmakers, and in those for painters and decorators. Of the fifty-six

schools, forty-six were administered by guilds, four by unions, and five by communities.

Besides, there are twelve industrial drawing schools for young men in the industries. These schools are supported in part by the guilds and unions. Instruction in industrial drawing, as a preparation for attendance at the technical schools for the toy industry, is given in eighteen elementary schools in the toy-making districts of Grünhainichen, Olbernhau, Seiffen, and Zöblitz.

The sixty-seven commercial schools are either exclusively apprentice schools, usually with a three years' course, or they include in addition higher departments with full-day instruction, and especial departments for pupils who possess the certificate for one year's military service. The instruction of the apprentices covers about ten hours per week. In twenty-five commercial schools there are special departments for girls. The course of instruction for these departments is usually one year. The commercial schools are in nine cases supported by communities, in forty-eight cases by commercial unions or similar organizations, in eight cases by private individuals, and in one case by a chamber of commerce.

The majority of the industrial educational institutions for girls are industrial technical schools. In the summer of 1909 there were twenty-three institutions devoted to general industrial training, twenty-five for crocheting, and two for straw-plaiting.

The number of agricultural schools amounts to eleven. The instruction in nine schools covers two half-years, and in the other schools three or four half-years. Their pupils are freed from the obligation of attending the general continuation schools. These schools are almost always under the control of the local agricultural unions.

### 4. Württemberg

The following table will show the condition of the Sunday and continuation schools, attendance at which is made compulsory by the law of August 17, 1909:

(*a*) Number of school centers, classes, and pupils — 1908–9.

| Kinds of School | School Centers with Schools for | | | Classes for Pupils | | | | |
|---|---|---|---|---|---|---|---|---|
| | Men | Women | Both Sexes | Men | Women | Both Sexes | Men's Industrial Schools | Women's Industrial Schools |
| Sunday schools | 138 | 1,439 | 266 | 138 | 1,481 | 269 | 2,590 | 30,542 |
| General continuation schools..... | 1,512 | 293 | 249 | 1,595 | 555 | 251 | 22,951 | 18,797 |

(*b*) Time of instruction in the general continuation schools:

NUMBER OF CLASSES HELD

| Only in the Winter Half-year | During the Whole Year | Only on Weekdays | Only on Sundays | On Weekdays and Sundays | Only in Daytime | Only in Evening | In Daytime and Evening |
|---|---|---|---|---|---|---|---|
| 1,708 | 693 | 2,061 | 99 | 241 | 869 | 1,330 | 202 |

The vocational continuation schools in 1908–9 included 168 industrial continuation schools, about one-fourth with compulsory attendance; seventeen commercial continuation schools, among which were five independent institutions (three with compulsory and two with voluntary attendance), and forty-five industrial drawing schools.

The first of April, 1909, was the time set for putting into effect the law of July 22, 1906, under which a thorough change in the number and formation of the vocational continuation schools was made. Up to the present time, decrees have been made for the carrying out of the law in the sixty-seven larger communities of the Kingdom. These decrees provide for the establishment of schools as follows:

| | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 |
|---|---|---|---|---|---|---|
| Industrial schools | 29 | 6 | 8 | 7 | 8 | 9 |
| Commercial schools | 13 | 2 | . | 2 | . | . |

In twelve of the industrial schools provision has been made for special departments for persons employed in commercial business. In nine other industrial schools, organization of such departments is necessary. At the opening of new schools compulsory attendance will be extended only to those in the first year, so that at the beginning of the

school year 1916, the new organization will be completed in sixty-seven of the larger communities of the country.

In the case of the smaller communities falling under the law, so far as they already maintain continuation schools and industrial continuation schools for girls, the carrying out of the new regulations will be left to the educational authorities.

Among vocational continuation schools of other sorts will be included thirty-three schools for women's work, three country housekeeping schools, three agricultural continuation schools, and eight farmers' winter schools.

### 5. Baden

In Baden the obligation of attendance at the general continuation school for boys extends to two years, and in the case of girls to one year. It is left to the decision of the individual community whether cooking and housekeeping instruction may replace the continuation school instruction for girls. The following official statement shows the condition of the general continuation schools on December 1st of the years indicated:

| Year | General Continuation Schools | | | | Cooking and Housekeeping Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Men Teachers | Women Teachers | Communities with School Kitchens | Additional Kitchens Outside | No. of Pupils (Girls) | No. of Teachers. |
| 1905 | 21,862 | 11,475 | 1,894 | 4 | 106 | 97 | 5,567 | 112 |
| 1906 | 21,590 | 11,012 | 1,887 | 3 | 113 | 133 | 6,147 | 120 |
| 1908 | .... | .... | .... | . | 130 | 176 | 7,246 | 137 |

The industrial continuation schools are of two kinds: in the larger places they appear as industrial schools, in the smaller (for the most part country places), as industrial continuation schools. Full-time teachers with special training give the instruction in industrial schools, but in the industrial continuation schools elementary teachers do the work as a side issue. According to an explanation in the budget for 1910, the authorities intend gradually to install more and more full-time teachers for the industrial continuation schools. The following table shows the condi-

tion of the industrial schools on December 1st of the school years 1906, 1907, and 1908:

| Year. | Industrial Continuation Schools | | | | Industrial Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | No. of Schools | No. of Teachers | Regular Pupils | Irregular Pupils | Number of Schools | Number of Teachers | Regular Pupils | Irregular Pupils |
| 1906 | 127 | 171 | 2,515 | 120 | 51 | 208 | 10,218 | 2,139 |
| 1907 | 132 | 177 | 2,604 | 142 | 53 | 220 | 11,587 | 2,504 |
| 1908 | 139 | ... | 2,745 | 109 | 53 | ... | 11,879 | 2,140 |

The commercial continuation schools are either independent city commercial schools or commercial departments of city industrial schools. The following table gives the condition of these schools on December 1st of the school years indicated:

| Year. | Independent City Commercial Schools | | | | Com. Departments in City Industrial Schools | | | |
|---|---|---|---|---|---|---|---|---|
| | No. of Schools | No. of Men Teachers | Number of Pupils | Number of Women Teachers | Departments | Men Teachers | Number of Boys | No. of Girls |
| 1906 | 11 | 81 | 2,297 | 775 | 17 | 44 | 507 | 95 |
| 1907 | 11 | 81 | 2,369 | 811 | 19 | 47 | 563 | 158 |
| 1908 | 11 | .. | 2,521 | 858 | 24 | .. | 659 | 197 |

On December 1, 1908, there were six commercial schools and commercial courses founded by commercial unions, with 390 pupils — 185 boys and 205 girls.

Finally, there are in Baden a great number of vocational schools for such persons as are no longer subject to the obligation of attendance at the continuation school. The condition of these schools in the school year 1907–8 was as follows:

| Kinds of Schools | Number of Schools | Attendance |
|---|---|---|
| Women's work schools of the Baden Women's unions | 44 | 3,891 |
| Women's work schools, supported by other unions, endowments, city communities, etc. | 31 | 2,189 |
| Housekeeping schools of different unions and endowments | 9 | 274 |
| District housekeeping schools for daughters of peasants | 5 | 163 |
| Agricultural winter schools | 14 | 518 |

## CHAPTER VI

# VOCATIONAL GUIDANCE

IN November, 1908, over 10,000 boys in Berlin attending the continuation schools were in unskilled labor. There were not enough apprentices by 4,000 to supply the demand because of the rush into the unskilled employments due to higher wages. This situation, which can be duplicated in many large cities like Berlin, without a system of vocational guidance, calls for public attention and assistance.

The continuation school forms the best point of support for the various organizations for guiding youth between fourteen and eighteen. There should be a real and organic connection between the continuation and the day school on the one hand, and the trade and industries of the community on the other. In German cities there is usually a labor bureau for boys and girls, whose officials have first-hand knowledge of the labor market and of the qualities of health and strength needed for each vocation. They avoid placing children with employers of unsatisfactory character, and strive to foster skilled manual labor, by preventing the drift into casual and unskilled occupations. The bureau co-operates with the elementary school in giving counsel and advice to young people choosing a vocation; and with the continuation school in protecting children against their parents and themselves, and sometimes against individual employers.

The educational authorities of the different German States are devoting considerable attention to this question but many cities in Eastern Germany have done nothing. Munich, Strassburg, and other cities of Western and Southern Germany have well organized bureaus. Alsace-Lorraine has seventeen such bureaus of vocational guidance. In Scotland the movement for vocational guidance has assumed a definite

direction, and Boston has worked out an excellent scheme for this purpose. The plan in operation in Strassburg and Munich will be of interest. The materials are taken from Mr. Clay's Compulsory Continuation Schools in Germany.

In Strassburg, the boy, while still at school, has been in touch with the Municipal Labor Bureau, which has separate departments for boys and girls. He has been advised as to his choice of a vocation and has decided what he wishes to do. This Bureau, an intermediary between boys leaving the elementary school and the employers of skilled labor, co-operates with the Chamber of Trade and the Chamber of Commerce.

From this Bureau information can be obtained as to the character of employers, and as to the likelihood of their fulfilling their responsibilities towards the boys. When about to leave school, the boy must visit the Labor Bureau, with the parent, and fill out a card of details. Here they will receive information and advice as to the best course to pursue in seeking employment. The Bureau endeavors to prevent the drift into the overcrowded ranks of errand boys and clerks, and to prevent the unscrupulous exploiting of child-labor. The purpose of this Bureau is to enable the boy to become a skilled laborer, and this is treated as a matter of public interest rather than one concerning individuals only.

A health officer co-operates in this work. The boy is examined on leaving school as to his physical health and soundness, and the details are entered on his card, together with his school record. Whenever a vacancy occurs, this card is consulted, and the boy is advised as to his fitness for the position offered.

The Labor Bureau in Germany experiences the same difficulties that we have in America. Families often are anxious to put their children where they can earn something immediately, rather than into apprenticeship, where little or nothing can be earned for some time. The Bureau makes a special effort to avoid sacrifices of the boys by encouraging them to enter into skilled labor. The ordinary

laborer can earn as much for a short time as the ordinary skilled workman. This, however, only lasts during the few summer months, but long enough to attract the inexperienced boy.

The following is the procedure in detail:

1. The teacher distributes cards to be filled in by all boys and girls leaving the elementary schools, and the parents are summoned some evening to have the purpose of the authorities explained to them. The cards stating the occupation desired must be taken to the Bureau in the next few days. The children have already been medically examined as to their fitness, and a list has been issued by the school authority showing all the trades which can be learned in or near Strassburg.

2. The employers meanwhile have sent to the Bureau their applications for apprentices and clerks. These cards are marked confidentially for approval or otherwise by the Chambers of Trades and of Commerce.

3. The children are seen at the Bureau and the officials put them into communication with the employers. Thus, automatically, provided they are fit, they tend to fall into the occupations where there are most vacancies.

4. All boys and girls must take control cards back to the teacher to show that they have been to the Bureau and had their names entered. The teacher exercises pressure until the card shows that they have found employment. It should be mentioned that the initial steps are taken by the teachers some four months before the children leave school.

The feature in Strassburg that immediately strikes the observer is the earnest interest taken by the Chamber of Trades in the continuation schools and in the Labor Bureau, and the resulting vital connection of these latter with the industries of the town and district.

The following showing will explain the opportunities presented to these boys for selecting occupations:

1. The branches of industry in Strassburg, with the numbers of the workmen engaged, in June 1907, were:

| | Male | Female |
|---|---|---|
| Commercial | 7,147 | 3,434 |
| Clothing | 2,537 | 3,730 |
| Food, drink, and tobacco | 3,465 | 2,157 |
| Building | 5,531 | 30 |
| Hotels and inns | 1,597 | 2,582 |
| Machine tool and instrument-making | 2,747 | 66 |
| Woodwork and carving | 1,821 | 347 |
| Cleaning | 703 | 1,304 |
| Metal-working | 1,564 | 68 |

2. The total population of the town of Strassburg between 14 and 18 years of age was:

| | |
|---|---|
| Males | 5,356 |
| Females | 6,110 |

3. Of boys from 14 to 18 years of age there were:

| | |
|---|---|
| (*a*) Unemployed (belonging to families without definite occupation) | 1,380 |
| (*b*) Employed in unskilled labor | 758 |

## ADVISORY EXPERT COMMITTEE (FACHSCHULKOMMISSION) OF THE GENERAL AND TRADE CONTINUATION SCHOOLS IN STRASSBURG, CONSISTING OF MEN ACTUALLY ENGAGED IN THE VARIOUS TRADES

(IN OFFICE FOR THREE YEARS)

| Number of Groups | No. of Members | Number of Groups | No. of Members |
|---|---|---|---|
| 1. Bakers | 7 | 21. Stonedressers | 1 |
| 2. Confectioners | 4 | 22. Locksmiths | 4 |
| 3. Butchers | 4 | 23. Smiths | 3 |
| 4. Cooks and waiters | 8 | 24. Machine-constructors | 3 |
| 5. Tailors | 5 | 25. Coppersmiths | 1 |
| 6. Shoemakers | 9 | 26. Electrical engineers | 2 |
| 7. Farmers and gardeners | 4 | 27. Instrument-makers | 2 |
| 8. Hairdressers | 7 | 28. Watchmakers | 1 |
| 9. Printers | 7 | 29. Tinsmiths and plumbers | 1 |
| 10. Compositors | 3 | 30. Plasterers | 3 |
| 11. Bookbinders | 5 | 31. Painters | 6 |
| 12. Druggists | 6 | 32. Upholsterers | 4 |
| 13. Grocers | 1 | 33. Goldsmiths | 3 |
| 14. Cabinetmakers | 8 | 34. Saddlers | 2 |
| 15. Carpenters | 2 | 35. Engravers | 2 |
| 16. Wheelwrights | 1 | 36. Surgical bandage-makers | 2 |
| 17. Coopers | 2 | 37. Photographers | 1 |
| 18. Masons | 5 | 38. Lithographers | 3 |
| 19. Stove-setters | 2 | 39. Wood-engravers | 1 |
| 20. Sweeps | 2 | 40. Color-printers | 2 |

STATISTICS OF CONTINUATION CLASSES IN STRASSBURG

| Occupations | Number of Boys | Number of Classes | Hours per Week |
|---|---|---|---|
| (*a*) Unskilled | 517 | 19 | 4 |
| (*b*) Bakers | 82 | 4 | 5 |
| Confectioners | 71 | 3 | 7 |
| Butchers | 21 | 1 | 6 |
| Cooks | 42 | 2 | 6 |
| Waiters | 40 | 2 | 6 |
| Druggists | 20 | 1 | 8 |
| Grocers | 43 | 2 | 6 |
| Shoemakers | 20 | 1 | 6 |
| Tailors | 47 | 2 | 6 |
| Hairdressers | 72 | 3 | 8 |
| Printers | .. | .. | 8 |
| Compositors | 69 | 4 | 6 |
| Bookbinders | 28 | 1 | 6 |
| Total | 560 | 26 | .. |
| (*c*) Masons | 76 | 3 | 8 |
| Stonedressers | 28 | 1 | 8 |
| Carpenters and wheelwrights | 24 | 1 | 8 |
| Cabinetmakers | 68 | 3 | 8 |
| Locksmiths | 81 | 3 | 8 |
| Metalworkers | 24 | 1 | 8 |
| Machine-fitters | 91 | 4 | 8 |
| Mechanicians | 57 | 2 | 8 |
| Electricians | 19 | 1 | 8 |
| Tinsmiths and plumbers | 67 | 3 | 8 |
| Plasterers | 18 | 1 | 8 |
| Painters | 36 | 2 | 8 |
| Upholsterers and saddlers | 41 | 1 | 8 |
| Goldsmiths and engravers | 19 | 1 | 8 |
| Photographers and lithographers | 20 | 1 | 8 |
| Total | 669 | 28 | .. |
| (*d*) Commercial | 414 | 18 | 9 |

| | | Pupils | Classes |
|---|---|---|---|
| Sum total | (*a*) | 517 | 19 |
| | (*b*) | 560 | 26 |
| | (*c*) | 669 | 27 |
| | (*d*) | 414 | 18 |
| | | 2,160 | 90 |

The Municipal Labor Bureau of Munich was able to place apprentices from the elementary schools during 1907 as follows:

| | Applications | Vacancies | Placed |
|---|---|---|---|
| Boys | 1,829 | 2,345 | 1,560 |
| Girls | 279 | 452 | 241 |

The greater number of the boys became mechanics, locksmiths, joiners, bakers, printers, or clerks, or went

into café employment. They are medically examined here as at Strassburg, before they leave school. No domestic servants or nurse girls are included in the above statistics. The girls went mainly into dressmaking or the printing or business houses.

The general procedure by which this bureau carries on its work is similar to that already described as in force at Strassburg, so that it is not necessary to repeat it here. The purpose is to avoid a loss of the results of the education of the elementary school, and this is achieved by close co-operation between the Bureau, the trade societies (including the individual employers), and the school authorities. While the Labor Bureau endeavors to put the right boys in the right places, and to prevent boys who are well able to take up a skilled trade from passing into unskilled work, the master, on his side, must be a suitable person, entitled to take apprentices. A guide book of the industrial occupations open to youth, explaining the work, the necessary qualifications, the prospects, the health conditions, the cost of training, etc., has been prepared. The services of the Bureau are gratis, and it is made clear to the parents that its only object is to bring boys and employers together, and that they — the parents — are free to choose the calling.

STATISTICS OF THE LABOR BUREAU OF MUNICH AS TO PLACING BOYS AND GIRLS AS APPRENTICES SINCE 1896

| Year | Applications | | | Vacancies | | | Placed | | |
|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Total | Boys | Girls | Total | Boys | Girls | Total |
| 1896 | 523 | 40 | 563 | 727 | 126 | 853 | 261 | 16 | 277 |
| 1897 | 365 | 74 | 439 | 634 | 104 | 738 | 243 | 35 | 278 |
| 1898 | 447 | 90 | 537 | 731 | 108 | 839 | 250 | 47 | 297 |
| 1899 | 252 | 88 | 340 | 658 | 154 | 812 | 172 | 61 | 233 |
| 1900 | 334 | 114 | 448 | 700 | 167 | 867 | 240 | 71 | 311 |
| 1901 | 337 | 110 | 447 | 629 | 130 | 759 | 196 | 45 | 241 |
| 1902 | 1,377 | 137 | 1,492 | 1,342 | 191 | 1,533 | 738 | 67 | 805 |
| 1903 | 2,610 | 309 | 2,919 | 2,381 | 440 | 2,821 | 1,493 | 191 | 1,684 |
| 1904 | 2,823 | 396 | 3,219 | 2,426 | 535 | 2,961 | 1,765 | 208 | 1,973 |
| 1905 | 2,698 | 440 | 3,138 | 2,510 | 584 | 3,094 | 1,888 | 256 | 2,144 |
| 1906 | 2,628 | 302 | 2,930 | 2,535 | 505 | 3,040 | 1,947 | 230 | 2,177 |
| 1907 | 1,829 | 279 | 2,108 | 2,354 | 452 | 2,806 | 1,560 | 241 | 1,801 |
| Total | 16,201 | 2,379 | 18,580 | 17,627 | 3,396 | 21,123 | 10,753 | 1,468 | 12,221 |

# LABOR BUREAU FORMS

## (1) STRASSBURG MUNICIPAL LABOR BUREAU

*(a) Card to be filled in by the intending apprentice.*

Name ..... Elementary School ..... Date and place of birth ..... Religion ..... Address ..... Name and occupation of father or guardian ..... Occupation chosen by the apprentice ..... Can the parents maintain (him or her) during the apprenticeship? .... Can they pay a premium? ..... May the apprentice take a place in the country? ..... What employer (if any) has he chosen? ..... His exact address .....

[On the reverse side.]

MEDICAL CERTIFICATE

1. Build ..... 2. Height and weight ..... 3. Appearance and condition ..... 4. Chest measurement ..... 5. Organs of the chest and abdomen ..... 6. The senses ..... 7. Remarks .....

REMARKS OF THE SCHOOL STAFF

School year..... Ability.....
Conduct..... Industry.....

The apprentice was referred by the Labor Bureau: Date ..... To: .....

Is he still in the place found for him? ..... If not, since when?..... Conduct of the apprentice ..... Checked (date) .....

*(b) Card to be filled in by the employer*

Date ..... Group ..... Section ..... Name of the employer or firm ..... Trade ..... Exact address ..... Number of apprentices desired ..... Length of apprenticeship ..... What premium is asked for? ..... What have the parents to provide? ..... Is board and lodging given? ..... Is the apprentice to receive pay? ..... When is the apprenticeship to begin? ..... How many assistants and apprentices do you employ? .....

(Stamp.) Remarks.

[On the reverse side.]

Apprentice referred to .....(date) ..... Remarks .....

*(c) Control card.*

1. Name of the Pupil ..... 2. Date of first application at the Bureau ..... 3. Dates of further applications ..... ..... .....
4. Case settled on the: (date) ..... (by) .....

(Stamp)

## (2) MUNICH MUNICIPAL LABOR BUREAU

*(a) Card to be filled in by the intending apprentice.*

School ..... Class ..... Christian and surname ..... Parents .....

1. Will the boy attend the eighth class the next year?
2. If not:
   Has the boy already a definite place in view?
   If so, with whom?
3. What occupation does the boy wish to take up?
4. If he wishes to be apprenticed:
   (*a*) Can he pay a premium?
   (*b*) Can he have his meals at home?
   (*c*) Can he sleep at home?

Signature of father (or mother) .....

N. B. The town Labor Bureau undertakes to give information about all kinds of posts free of charge. The parents of the children who apply to the Bureau are absolutely free to make their choice of their future occupation. The Labor Bureau only attempts to bring the applicants into touch with the most suitable posts. The drawing up of any contract is left entirely to the two persons concerned.

*(b) Application for post as apprentice.*

Christian and surname. ..... Address ..... Age ..... Height ..... Name and trade of father or guardian ..... Place of birth. ..... Which school last attended? ..... Which class? ..... To what trade does he wish to be apprenticed? ..... Will a post outside the town be accepted? ..... Can the boy sleep and have his meals at home? ..... Can a premium be paid? ..... When can he begin? ..... Remarks .....

Signature of the applicant .....

## CHAPTER VII

# SECONDARY TECHNICAL SCHOOLS

GERMANY'S higher technical education is given in eleven technical universities. These schools (to make use of a figure of speech of Dr. Kerschensteiner's) provide the captains of industry. In Germany a large number of secondary and lower technical institutions undertake to train the subaltern officers and the rank and file of the industrial army. These technical secondary schools are very numerous in Germany, while they are almost unknown in England and America.

They are divided into two groups: the higher and lower secondary technical schools. The higher group generally requires of candidates for admission the completion of the course in a six-year secondary school, or its equivalent, and from one to two years of practical outside experience. The lower group usually admits pupils who have completed the elementary school and their apprenticeship in some trade. The work of the higher group usually extends over two and a half years or more, and, on account of better preparatory training, is more severely mathematical and scientific than the work of the lower group. The work of the lower group usually includes from one and one-half to two years.

Most of these secondary technical schools may be classified according to their work, as building-trades schools, machine-trades schools, art-trades schools, textile schools, agricultural schools, etc. There are, however, a large number of special technical schools that would not be covered by this classification. The Germans have attempted to supply schools for every industry that would be benefited by them, and systems of classification that have stood in the way have been sacrificed.

These technical secondary schools have been extremely

important and useful in Germany, Director Peters of the Association of German Engineers stated a few years ago that, while there was a surfeit of engineers turned out by the technical universities, engineers of a lower grade and technical experts who were fitted for the positions of machine constructors, technical engineers, mechanical engineers, chemists, superintendents of departments, building experts, etc., were in great demand. He stated that of 3,281 engi-

SECONDARY TECHNICAL SCHOOLS IN GERMANY

| States of Germany | Schools for the Building Trades | Schools for Machine Building Trades. | Schools for Miners and Smelters | Schools for Metal Workers | Schools for the Textile Industries | Schools for the Wood Industries | Schools of the Ceramic Arts | Art-Trades Schools | Trade Schools | Schools for Locksmiths and Blacksmiths | Navigation Schools and Ship Machine Builders | Schools of River Navigation | Other Technical Schools | Public | Private |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prussia | 24 | 9 | 53 | 5 | 36 | 7 | 3 | 21 | 17 | 47 | 35 | 37 | 3 | 290 | 7 |
| Bavaria | 10 | 4 | .. | .. | 2 | 7 | 2 | 2 | 16 | 7 | .. | 11 | 1 | 56 | 6 |
| Saxony | 10 | 4 | 2 | 3 | 56 | 1 | .. | 3 | 3 | .. | .. | 7 | 23 | 93 | 19 |
| Württemberg | .. | .. | .. | 1 | 5 | .. | .. | 1 | .. | .. | .. | .. | .. | 7 | .. |
| Baden | 1 | .. | .. | 1 | .. | 7 | .. | 2 | .. | 5 | .. | 3 | 1 | 20 | .. |
| Hesse | 3 | 2 | .. | .. | 1 | .. | .. | 4 | .. | .. | .. | 2 | 2 | 11 | 3 |
| Mecklenburg-Schwerin | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | 4 | 1 |
| Mecklenburg-Strelitz | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 |
| Saxe-Weimar | 2 | 1 | .. | .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 6 | 1 |
| Oldenburg | 2 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | 3 | 1 |
| Brunswick | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Saxe-Meiningen | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. |
| Saxe-Altenburg | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Saxe-Coburg-Gotha | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. |
| Anhalt | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 4 | 1 |
| Schwarzburg-Sondershausen | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Schwarzburg-Rudolstadt | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Waldeck | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Reuss junior line | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| Reuss senior line | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Schaumburg-Lippe | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Lippe-Detmold | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| Lübeck | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | .. |
| Bremen | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. |
| Hamburg | 1 | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | .. | .. | .. | 4 | .. |
| Alsace-Lorraine | .. | .. | 2 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | 5 | .. |
| Total | 63 | 26 | 58 | 10 | 104 | 24 | 6 | 37 | 36 | 61 | 40 | 52 | 43 | 515 | 46 |

neers employed in 105 of the most prominent German industrial firms only 1,124 (or 34 per cent) were from technical universities, while 2,137 (or 64 per cent) were from secondary technical schools. The Minister of Commerce and Industry in his recent report has stated that, while Germany is well supplied with engineers of the kind turned out by the technical universities, she could use ten times as many of the grade turned out by the secondary technical schools. English authorities seem also to believe that England's inferiority in technical instruction, as compared to Germany, is not in the university grade of engineers, but in the secondary grade, which is almost unprovided for in England.

THE MIDDLE TECHNICAL SCHOOLS (HÖHERE)

| Provinces | Middle Industrial Technical Schools | | | | | Commercial | | Agricultural Schools | Art-Trades Schools |
|---|---|---|---|---|---|---|---|---|---|
| | With Several Departments | | With One Department Higher | | | | | | |
| | | | Civil Engineering Schools | | Textile Technical Schools | | | | |
| | Public | Private | Public | Private | Public | Public | Private | | |
| Prussia | .. | .. | 11 | .. | 7 | 5 | ? | 18 | 7 |
| Bavaria | 1 | .. | 1 | .. | 1 | 7 | 1 | 2 | 2 |
| Saxony | 1 | 4 | .. | .. | 4 | 10 | 6 | 1 | 2 |
| Württemberg | 1 | .. | .. | .. | 1 | .. | 3 | .. | 1 |
| Baden | .. | 1 | .. | .. | .. | .. | .. | .. | 2 |
| Hesse | .. | 1 | .. | .. | .. | 1 | .. | 1 | 1 |
| Saxe-Weimar | .. | .. | .. | 1 | .. | .. | 1 | .. | 2 |
| Oldenburg | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Brunswick | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Anhalt | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 |
| Reuss I. L. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Lübeck | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |
| Bremen | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Hamburg | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 |
| Alsace-Lorraine | 1 | 1 | .. | .. | .. | .. | 2 | 1 | 1 |

Tables after R. Knabe's Das Deutsche Unterrichtswesen der Gegenwart. These tables are several years old (1902).

## CHAPTER VIII

# BUILDING-TRADES SCHOOLS

FOR no other industry in Germany has the necessity of industrial educational institutions been recognized so early and so generally as for the building trades. In every place where systems of industrial education began to develop, the technical training, and particularly in drawing, of those engaged in the building trades was given special attention. This was provided for either by departments for those in the building trades in the general industrial drawing and art schools, or by special technical institutions for this purpose, such as architectural schools, building academies, or building-trades schools. Formerly, the departmental method was preferred, and it is still employed in Austria and South Germany, but at the present time Prussia is establishing separate building-trades schools.

With the growing extension and development of systems of industrial education in the larger states of Germany, greater attention is given to technique; and the division of labor required by this has resulted in splitting up the existing general schools into special schools for single subjects or for only a few related subjects. This specializing has a great advantage in that it makes possible a thorough training that meets the comprehensive demands for technical knowledge and power in persons carrying on different branches of industry, but if it is pushed too far it leads to an unnecessary increase in the cost of industrial training, and to a one-sidedness which is an obstacle to later development. The German feels that adaptability to changing situations must not be crushed out.

The oldest existing technical school for the building trades in all Germany is probably the one in Munich, which was founded in the year 1820 by Mitter and Shöpf, first

as a private undertaking with State and city support, and later, on the 10th of April, 1823, as a public institution. Holzminden followed in 1832; Saxony, with Chemnitz, Dresden, Leipsic, Plauen, and Zittau, in 1837–1840; in 1845, Stuttgart, and many others soon after.

The aim of these building-trades schools was originally very modest. They undertook to teach the knowledge of materials used in construction, architectural drawing, and cost estimates, all indispensable both for the practice of the trade and for the master's certificate. The drawing was usually from models. The school attendance covered two winter semesters; the summer was left free for work in building. The teachers were a few practical men who devoted part of their time to this instruction for very small pay. The number of schools and courses was small; the general equipment was meager; the supply of apparatus was very incomplete. In spite of this, the instruction satisfied the requirements of most masters in the building trades half a century ago. The methods of building were based upon a few generally known rules; police regulations made very small demands upon the builder; and most of the buildings in city or country could be put up by builders without any thorough-going technical or artistic training. Large and expensive buildings were not often needed until the present crowding into the cities took place.

This was changed in the last decade of the nineteenth century; the sciences of architecture and engineering made enormous advances. In consequence of this, arrangements for heating, ventilation, and lighting were perfected; iron construction and electrical appliances were introduced; greater demands, with respect to health and security, made their appearance; the enormous development of commerce, industry, and social intercourse brought the need for new sorts of special and difficult building construction of all kinds, such as factories, warehouses, business and mercantile houses, and hotels; states and communities required public buildings for government purposes, and for schools and other educational institutions;

the needs of commerce and transportation demanded great constructions for railways, waterways, streets, and canals; increase in wealth made demands on the builders for beauty, convenience, and comfort in a way never known before. As increased demands were made upon the architects and engineers, a special class of technical men of lower rank was required upon whom would fall the task of taking up and carrying out practically the plans of the consulting architect and engineer, men who were qualified to work out in detail the broad outlines of the architect or engineer, to work up the estimates of cost, and to superintend the actual construction.

On account of this increase in the public demands upon the builders it became necessary to improve, broaden, and deepen the instruction given in the building-trades schools. The time of instruction was, therefore, increased to three, four, or five semesters. As the subjects of instruction soon became entirely too numerous to be handled by all in attendance, special departments were created for the training of architects, civil engineers, and stonemasons. Schools and courses were increased and better equipped, apparatus and methods of instruction were perfected, and there was created a good teaching personnel which devoted its entire time to the school, with better pay and a pension system. In spite of all these improvements, it became more and more apparent that only a limited number of pupils for the building trades were in a position to take up the entire list of subjects, and to work through them thoroughly, and that comparatively few of those entering the building-trades school completed its course. It has become necessary therefore, to increase the demands for admission, and to admit only such young people as have for a long time worked practically as builders, and have received a good elementary school training. In order to make easier the attainment of this preliminary knowledge for those who had been refused admittance, introductory classes were sometimes added to the building-trades school. Finally, the step was taken of founding so-called foremen's schools for the lower workers

in the building trades — special building-trades schools with lower aims and correspondingly shortened courses of instruction.

There are about fifty building-trades schools in Germany, most of them with two departments: architectural (Hochbau) and civil engineering (Tiefbau). In this latter department are included courses for civil engineering, road, street, and railway building, hydraulic engineering and bridge construction, and sometimes irrigation and drainage.

The Prussian Ministry states officially that the purpose of these schools is to prepare:

1. Skilled laborers for the building trades who intend to become independent contractors, masons, carpenters, etc.

2. Draftsmen and designers, as well as building foremen, for architecture and civil engineering.

3. Officials employed in government, military, railroad, and city building, or civil engineering for provincial, county, and communal administration.

In these schools men are trained for positions such as architectural secretary, inspector, superintendent of the erection of water works, railroad contractor and construction engineer, building inspector, secretary of military works in the war department, and technical secretary in the naval department. Many of the local departments also require this education from inspectors and contractors for their technical buildings and surface improvements.

The course of these schools consists of five grades, each lasting half a year. The three lower grades are the same in the departments for architecture and civil engineering; while in the two highest grades specialization is permitted, these grades being devoted to the special instruction demanded by the two departments. The work of the three lower grades is so planned as to give to students who are compelled to leave, after finishing the first three semesters' work, something definite and substantial that will fit them for lower grade positions, such as foremen. In this way an effort is made to prevent the sacrifice of the interests of

students who are unable to remain the full five semesters. Students stopping at the end of the third semester might very properly be regarded as students of the lower group of secondary technical schools, while those completing the full five semesters are considered to be members of the higher group of secondary technical schools. The work is carried on both in winter and in summer, and provision is made for interruptions for the benefit of students who cannot put in the two and a half years consecutively. The State regulations urge students not to interrupt attendance for more than one-half year in time, and to attend the last two semesters without interruption.

Students admitted to this institution must have completed their sixteenth year, and have satisfactorily finished the work of the elementary school. As a rule, they must pass an examination. Candidates of a fully graded elementary school and of a two years' continuation school of six hours a week, or those who have secured the privilege of one year's voluntary military service, are excused from the examination. The examination, however, is only in two subjects, German and arithmetic, and is comparatively simple. In many places a preparatory class is provided for students who fail in the examination. Besides this, twelve months of active work at a building trade is required before admission. There are some modifications in this requirement for students taking the course in civil engineering.

Students are required to pay tuition of about twenty dollars a semestet. In some schools the tuition is higher. Foreign students must pay about five times as much. Besides this, there is a small fee for accident insurance. The students are required to furnish their own books and materials. Some pupils who are poor are excused from the payment of tuition if they prove to be good students in every sense of the word. The rules governing these schools are rather strict.

The course of study in the architectural department (Hochbau) is as follows:

| Subjects | Number of Hours per Week in each Subject | | | | | |
|---|---|---|---|---|---|---|
| | Class V | Class IV | Class III | Class II | Class I | Total |
| German, business, and law | 2 | 2 | 3 | 2 | .. | 9 |
| Arithmetic | 2 | 2 | .. | .. | .. | 4 |
| Algebra | 3 | 2 | 2 | .. | .. | .. |
| Plane geometry, solid geometry, and trigonometry | 5 | 3 | 2 | 2 | .. | 19 |
| Natural cience | 3 | 3 | 2 | .. | .. | 8 |
| Building materials | .. | 2 | 2 | .. | .. | 4 |
| Surveying and leveling | .. | .. | 2 | .. | .. | 2 |
| Projection | 6 | 2 | .. | 2 | 2 | 12 |
| Statics | .. | 4 | 3 | 3 | 5 | 15 |
| Building construction | 7 | 7 | 8 | 6 | 4 | 32 |
| Architectural drawing | 8 | 8 | 8 | 4 | 4 | 32 |
| Theory of architecture and building regulations | 2 | 3 | 6 | 3 | 4 | 18 |
| Designs for buildings | .. | .. | .. | 12 | 14 | 26 |
| Architectural forms | 2 | 2 | 4 | 6 | 5 | 19 |
| Freehand drawing | 4 | 2 | .. | 4 | 4 | 14 |
| Estimates and bookkeeping | .. | 2 | 2 | .. | 2 | 6 |
| Total | 44 | 44 | 44 | 44 | 44 | 220 |
| OPTIONAL COURSES | | | | | | |
| Modeling | 4 | 4 | 4 | 2 | .. | 14 |

The course of study in the department of civil engineering (Tiefbau) is as follows:

| Subjects (Classes V, IV, and III as above) | Number of Hours per Week in each Subject | | |
|---|---|---|---|
| | Class II | Class I | Total |
| German, business, and law | 2 | .. | 9 |
| Arithmetic | .. | .. | 4 |
| Algebra | | | |
| Plane geometry, solid geometry and trigonometry | 2 | 2 | 21 |
| Natural science and building materials | 2 | .. | 14 |
| Surveying, leveling, and working drawings | 6 | 4 | 12 |
| Projection | 2 | .. | 10 |
| Statics | 4 | 5 | 16 |
| Freehand drawing | .. | .. | 6 |
| Architectural forms | .. | .. | 8 |
| Building construction and architectural drawing | 4 | 4 | 54 |
| Theory of architecture and building regulations | .. | .. | 11 |
| Ground, street, and city improvements | 4 | 7 | 11 |
| Hydraulic engineering | 5 | 7 | 12 |
| Bridge building | 5 | 5 | 10 |
| Railroad building | 6 | 6 | 12 |
| Railroad architecture | .. | 2 | 2 |
| Principles of machinery | .. | 2 | 2 |
| Estimates and bookkeeping | 2 | .. | 6 |
| Total | 44 | 44 | 220 |
| OPTIONAL COURSES | | | |
| Modeling | 2 | .. | 14 |

## CHAPTER IX

# MACHINE-TRADES SCHOOLS

THE organization of schools of mechanical engineering has proceeded along lines similar to those of the building-trades schools. At first the training of engineers, constructors, foremen, machine draftsmen, etc., was given in the technical departments of various industrial schools. This combination of departments in the technical schools is continued up to the present time in many states of Germany, and must be retained where economy is necessary, and where the number of pupils is small. Prussia has developed an enormous iron industry during the last twenty years, and has followed the policy of founding special schools for mechanical engineering, some of which are secondary schools. These train machinists, mechanical draftsmen, and technical officials of middle rank, and others preparing for positions that require a less highly developed technical ability, both in industries and in the service of the State. To both these classes of engineering schools are often added evening and Sunday courses for workmen who cannot afford to give up work entirely and attend school. These evening and Sunday courses furnish them an opportunity to supplement their technical knowledge, and increase their skill as draftsmen. The last step has been to add courses of two or three semesters to the technical schools, for the training of efficient workmen in the machine industry for positions as managers, foremen, etc.

As in the case of the building trades, we find in the machine trades a great number of private technical schools, usually called "Technika." They are generally less efficient than the public institutions mentioned above. In addition to these, various handicraft and art-trades schools and the large continuation and guild schools frequently offer oppor-

tunities in their courses for the training of lathe-men, blacksmiths, locksmiths, and other metal workers. Training in such courses, however, is usually confined to technical drawing.

There are two grades of such machine-trades schools in Prussia. The one called Höhere is a secondary school requiring greater academic preparation and a longer course of study than the other and preparing for higher positions in the industries as well as in departments of government service. Students may be admitted to one of the higher group of schools on compliance with one of the following sets of conditions:

I. The higher of these two grades of the machine-trades or engineering schools (Höhere Maschinenbauschulen) is a real secondary technical school, which means in Germany a school requiring as a condition for admission the completion of six years of the course in the academic secondary school. These schools require, further, that the applicant must possess the required skill in drawing, and must have been employed practically in a workshop or factory for a period of two years.

II. Students may be admitted who show that they have attended for two years the preparatory class of any machine-trades school, and can present evidence of satisfactory work there. For admission to these preparatory courses a good elementary education and two and a half years of apprentice work in the workshop are required.

III. The applicant may furnish proof that he possesses the certificate for one year's military service, and that he has the required skill in drawing and has completed two years of practical work in the shop or factory.

IV. He may present a report of successful attendance at any vocational school approved by the Ministry of Commerce, first showing that he possesses the required skill in drawing and shop practice.

V. He may enter on passing an examination for admission and proving that he has had three years of practical experience in the shop or factory. The director of any institution may, with the consent of the local board of trustees, reduce the requirement of three years of experience.

This higher mechanical engineering school provides for the instruction of engineers, inspectors, and officers of engineering works and allied industries, as well as for draftsmen in the offices of the same; it also provides future owners and managers of such industrial plants or allied industries with the technical knowledge that they need. The lower group of mechanical engineering schools (Maschinenbauschulen) is intended for lower technical inspectors and overseers and foremen. For some years the higher group seemed to be most in favor with the German industrialists, but later reports show a renewed interest in the lower group of schools. At present the policy is not to build more of the higher group, the last schools in Frankfort and elsewhere being schools of the lower group. These are often combined with departments for smelting and foundry work.

The difference between these two groups of schools is not merely in the preliminary qualifications required, but also in the instruction given. The one requires two-thirds of the course in a German secondary school, which means about one-half of the work covered by an American city high school; the other takes pupils directly from the elementary school. The one requires only two years of work in shop or factory; the other requires not less than four years of such work. Students come to the higher school better prepared academically; students come to the lower school better prepared practically. The instruction given varies according to the preparation. The higher school, with students more thoroughly trained in mathematics and science, can carry the work further and develop it in a more scientific manner; the lower school must turn its attention more closely to the practical side of the work.

An indispensable condition for admission into either of these schools is some practical experience. In this respect they differ from the schools of Austria and Switzerland. Without this practical work the student lacks the interest that comes from the practical understanding of his problem. "Practical work" means employment in shop or factory under actual shop conditions, including employment in fitting, at the turning lathe, in modeling, in forming in the foundry and smithy, and in driving and attending to machinery. The student must put in the full number of hours of work, and submit to the rules and regulations of the work like any other workman.

The graduates of these schools may attend the technical universities as visitors, but cannot study for a degree, as they have not completed the full course of a nine years' secondary school. The purpose of these schools is to furnish a certain amount of technical instruction, without encroaching upon the work of the technical universities. The buildings in which the schools are held are well equipped with drawing-rooms, laboratories for physics, chemistry, and electricity, and workshops for practical work. The following table will give some idea of the later occupations of graduates of these schools. The first column shows the occupations of graduates of the Duisburg mechanical en-

| Occupations | Duisburg Graduates from Sept. 29, 1883 to April 10, 1898 | Dortmund Graduates from Sept. 29, 1892 to April 10, 1898 |
|---|---|---|
| Heads of establishments | 54 | 1 |
| Other officers of establishments | 257 | 107 |
| Machine builders and foremen | 39 | 18 |
| Owners of establishments or shops | 10 | 3 |
| Wage-workers | 34 | 9 |
| Draftsmen and technical experts in offices | 86 | 55 |
| Assistant chemists | 3 | ... |
| Students at other schools | 11 | 1 |
| Other than technical work | 4 | 1 |
| Military service | 16 | 23 |
| Deceased | 11 | ... |
| Unknown | 26 | 21 |
| Total | 531 | 239 |

gineering and smelting school, a school of lower rank; the second column those of graduates of the Dortmund combined mechanical engineering and higher mechanical engineering school. The positions occupied by the graduates of these schools give a pretty good idea of the usefulness of the instruction given there.

The course for the higher school of mechanical engi neering is five semesters in length, and that of the lower four. The following tables show the studies taken in the two divisions of the Dortmund combined school for mechanical engineering and higher mechanical engineering, giving the number of hours per week for lectures and practical exercises:

STUDIES OF THE HIGHER MECHANICAL ENGINEERING SCHOOL IN DORTMUND

| Subjects of Instruction | Cl. V 1st Half-year lec. ex. | Cl. IV 2nd Half-year lec. ex. | Cl. III 3rd Half-Year lec. ex. | Cl. II 4th Half-year lec. ex. | Cl. I 5th Half-year lec. ex. | Total lec. ex. |
|---|---|---|---|---|---|---|
| Civics, principles of law | 1 .. | 2 .. | .. .. | .. .. | .. .. | 3 .. |
| Mathematics | 8 .. | 6 .. | 4 .. | .. .. | .. .. | 18 .. |
| Physics | 4 .. | 2 .. | .. .. | .. .. | .. .. | 6 .. |
| Chemistry | 4 .. | .. .. | .. .. | .. .. | .. .. | 4 .. |
| Exercises in lettering | .. 1 | .. .. | .. .. | .. .. | .. .. | .. 1 |
| Descriptive geometry | .. 10 | .. .. | .. .. | .. .. | .. .. | .. 10 |
| Mechanics | 6 .. | 6 .. | 6 .. | .. .. | .. .. | 18 .. |
| Principles of machinery | .. 6 | 6 8 | 4 8 | .. .. | .. .. | 10 22 |
| Study of motors | .. .. | .. .. | .. .. | 10 } 10 | 8 } .. | 18 } |
| Study of lifting-machines | .. .. | .. .. | .. .. | 4 } | 2 } 22 | 6 } 32 |
| Electrotechnology | .. .. | .. .. | 4 .. | 4 | 2 } | 10 } |
| Science of building | .. .. | .. .. | 4 | 8 | .. .. | 12 |
| Technology | | 10 | 10 | 2 | 2 | 24 |
| Experiments in the laboratories | .. .. | .. .. | .. 2 | .. 4 | .. 4 | .. 10 |
| Prevention of accidents and industrial hygiene | .. .. | .. .. | .. .. | .. .. | 1 .. | 4 .. |
| Total | 40 | 40 | 42 | 42 | 41 | 205 |

STUDIES OF THE MECHANICAL ENGINEERING SCHOOL

| Subjects of Instruction | Cl. IV 1st Half-year lec. | ex. | Cl. III 2nd Half-year lec. | ex. | Cl. II 3rd Half-year lec. | ex. | Cl. I 4th Half-year lec. | ex. | Total lec. | ex. |
|---|---|---|---|---|---|---|---|---|---|---|
| German and principles of business | 6 | .. | 2 | .. | 2 | .. | 2 | .. | 12 | .. |
| Arithmetic | 6 | .. | .. | .. | .. | .. | .. | .. | 6 | .. |
| Mathematics | 7 | .. | 6 | .. | 4 | .. | 2 | .. | 19 | .. |
| Physics | 4 | .. | 2 | .. | .. | .. | .. | .. | 6 | .. |
| Chemistry | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| Geometry and projective drawing, technical freehand drawing, and exercises in lettering | .. | 17 | .. | .. | .. | .. | .. | .. | .. | 17 |
| Mechanics | .. | .. | 5 | .. | 4 | .. | 2 | .. | 11 | .. |
| Principles of mechanics | .. | .. | 6 | 10 | 1 | 3 | .. | 2 | 7 | 15 |
| Study of motors | .. | .. | .. | .. | 4 | .. | 9 | 8 | 13 | 8 |
| Study of lifting-machines | .. | .. | .. | .. | 2 | 2 | 2 | 3 | 4 | 5 |
| Electrotechnology | .. | .. | 4 | .. | 2 | .. | 4 | .. | 10 | .. |
| Theory of building | .. | .. | .. | .. | 4 | .. | .. | .. | 4 | |
| Technology | .. | .. | 5 | | 10 | | 4 | | 19 | |
| Experiments in the laboratory | .. | .. | .. | 2 | .. | 4 | .. | 4 | .. | 10 |
| Prevention of accidents and industrial hygiene | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. |
| Total | 42 | | 42 | | 42 | | 43 | | 169 | |

Both of these schools include departments for evening and Sunday work for persons who cannot give their full time to the school. The work done in these evening and Sunday classes covers, in part, the work done in the day schools, and may be accepted in place of it. Below are given the classes in the evening and Sunday schools of the Engineering and Smelting School of Duisburg:

| Subject of Instruction | No. of Hours per Week |
|---|---|
| German, business, and civics, I, II, III | 2 |
| Arithmetic, I, II | 3 |
| Mathematics: Algebra I, II, III | 2 |
| Geometry I, II | 2 |
| Calculation of surfaces and solids | 2 |
| Physics | 4 |
| Electrotechnology I, II, III | 2 |
| Principles of machinery | 4 |
| Theory of machinery (steam-boilers, derricks, and steam-engines) | 4 |
| Drawing: Geometrical drawing | 6 |
| Technical freehand drawing and projective drawing I, II, III | 4 |
| Mechanical drawing I, II | 4 |
| Penmanship | 1 |
| Total | 40 |

## CHAPTER X

# ART-TRADES SCHOOLS

THE art-trades schools of Germany owe their existence in the first place to the London Exposition of 1851. The productions of the French art-trades far surpassed those of Germany, Austria, or England, and their superiority gave them a commanding position in the markets of the world. All three countries attempted to increase their competitive power in these lines by founding art-trades schools, England founding the South Kensington Museum. The others soon followed her lead. Germany was also influenced by the gradually growing conviction that by introducing the element of art it was possible to save the handicrafts, which were fighting for their existence, so hard-pressed by the machine that in the '70's their complete downfall was prophesied as very near.

Academies of drawing and art and industrial schools had been founded in the eighteenth century and the beginning of the nineteenth century for training in industrial drawing. They had included in their programs, in the '20's and '30's, the promotion of the industries by the founding of numerous industrial and polytechnical unions for the preservation of the artistic handicrafts. The difficulties at this time seemed to lie not so much upon the artistic as upon the technical side. It seemed to be better first to provide for the men in the industries the mathematical, scientific, commercial, and economic knowledge required by modern production; to teach new and better ways of doing business, to introduce new branches of work into the country. Accordingly, the furthering of the artistic interest, the training of the taste, seemed to be of less immediate importance to the worker than scientific and technical training. This was only natural, as the German people after the Napoleonic

wars were so poor that it was necessary for them to abandon almost every attempt to cultivate the beautiful by means of art study and to satisfy themselves with the simplest modes of living.

England, herself, drew the first lesson from the exposition in 1851, and founded Departments of Science and Art and the South Kensington Museum in London to care for and promote the art-trades. This was to be brought about by model collections of artistic objects, through lectures on the history of art and technology, by teaching in workshops, by far-reaching care of instruction in drawing and modeling, by prizes for excellent artistic work, and similar measures. Nearly all later museums of industrial art and the art-trades schools connected with them on the Continent have arisen in a similar way; first, Vienna, 1863; Berlin, 1867; next Munich, Nuremberg, Karlsruhe, Dresden, Leipsic, Düsseldorf, and others. It should be mentioned that the basis for an industrial museum in Stuttgart was provided as early as 1850 through the erection of a "Würtemberg model collection."

The schools giving instruction in industrial art at the present time are divided into four groups:

1. Industrial continuation schools for the art trades.
2. Schools for handicrafts.
3. Schools for industrial art and handicrafts.
4. Industrial art schools.

They teach the applications of art to the industries. The industrial art schools are chiefly day schools. The industrial art and handicraft schools are open during the day, but have evening courses for craftsmen and sometimes for apprentices. The handicraft schools and the continuation schools for the art trades are largely for evening work.

In each and every case they endeavor to adapt their program of study to the peculiar industrial conditions of the locality, and offer opportunities for instruction in all kinds of skilled labor in all branches of the art trades. The program of study consists sometimes of individual courses in particular art trades, sometimes of groups of

courses, all related to a predominant local industry. In the latter case a fixed course of study is provided, but in no school is the course of study so rigidly enforced as to prevent gifted pupils from branching out into individual work. In connection with most of these schools there are preparatory classes which give instruction to students deficient in drawing. In all schools there are classes in which pure artistic work, or designing, or general technical education is given. Courses of lectures on designing, drawing, and the history of art are provided, and at present shopwork is universal.

In almost all schools instruction is given in mathematics, mechanics, physics, and knowledge of materials. The different branches of drawing are carried on, both as general courses and as technical courses dealing with artistic designing.

Special courses leading to the local industries are the most important part of the instruction in the industrial art schools. While the schools of the country have no uniform program, there are always courses for decorative painters, furniture-designers, sculptors, modelers, locksmiths, and jewelers; while most of the schools offer further courses for engravers, etchers, enamelers, lithographers, and book-designers. In most cases there are courses for wall-decorating, ceramic arts, bookbinding, and women's artistic handicrafts.

In all special vocational courses the student is, as far as possible, prepared for his occupation, so that he is able not only to sketch or design artistic work but to execute practically in the workshop, in the material proposed, the designs or plans prepared. Besides this, there are lectures in technical subjects, such as knowledge of metals, the science of construction, estimates, and business rules. The length of the course varies from two to four years.

All these schools have workshops. The tendency is to increase the number. Shops most frequently seen are those for decorators, chasers, engravers, enamelers, and wood-carvers. There are often workshops for lithographers,

jewelers, and printers; and occasionally shops for artistic bookbinding, gilding, the ceramic arts, hand-weaving, stone-cutting, women's art work, leather work, and photography. The schools attempt to use the workshop as a safeguard against its students becoming mere draftsmen. In these shops not only can the designer acquire manual dexterity, but he can test the practicability of his designs and learn to keep his feet on the ground.

The evening and Sunday instruction is a very important part of the work of all industrial art and handicraft schools. Here the instruction is practically all for the trades. Many apprentices are admitted, although the work done is not always accepted as a substitute for that of the ordinary continuation school. Students are usually allowed to choose the subjects that interest them, if they are prepared to carry them on properly.

These schools make an effort to have the art grow out of the industry, so that workshops, knowledge of materials used, and drawing are required. They endeavor to apply art to industry, and to train their students to utilize the gracefulness and harmony of nature in the production of objects for the trades. To durable and useful objects they try to add grace of form and harmony of color.

Formerly the study of classical and mediaeval art made up the greater part of the instruction. During the last few years great attention has been given to the study of surroundings, to landscapes, and to local coloring. Much attention is devoted to the study of plants, animals, and men, and efforts are made to develop the individuality and originality of the pupils. While the study of the old styles of art has not been discontinued, it does not occupy the position it once had.

Students in the architectural department of the schools make models in cardboard or gypsum, or by saw-work; the furniture-designers and cabinet-makers work out their designs as sketchmodels in clay or plastilina, and receive instruction in wood-carving, veneer-cutting, etching wood, and other artistic features of carpentry. The art-trade

designers and lithographers etch in copper and zinc, engrave ornaments of various materials, make copper printing-plates from their own designs and sketches, print with the same in the copper printing-press, and practice drawing on stone; they model in clay and plastilina, or emboss, punch, and cut leather, and execute work by the etching process. The ceramic designs of the pupils are also executed in the actual workshops, either in school or outside. In no two schools is there the same course of study; but everywhere there is practical adjustment to local conditions.

Below is a sketch of the Art-Trades School at Düsseldorf, taken from an English Government report written by Dr. Rose, formerly British Consul at Stuttgart, which will give an idea of the work of one of these schools:

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"The art-trades school at Düsseldorf aims at training efficient craftsmen for the requirements of the art handicrafts and industries, and endeavors to exercise a stimulating and supporting influence upon the home art-trade industries in general.

The school proposes to attain these objects by the following means: — (1) By systematically instructing the pupils in good taste and sentiment for the artistic in construction and arrangement. (2) By initiating the pupils in the principles of drawing and plastic representation. (3) By closely connecting the instruction given with manual work and by penetrating into the essential principles of construction, with special regard to the properties of materials. (4) By awakening and developing the artistic creative faculties of the pupils and training them in initiative and independent work. (5) By imparting artistic advice to persons engaged in the art-trade branches of Düsseldorf and the neighboring district, and to all persons desirous of artistic effect in the arrangement of their environment.

Pupils for the preparatory and evening schools must be at least 15 years old, have passed through the elementary

school, and have definitely decided upon the choice of an art-trade branch of occupation.

Pupils for the special school must have passed through the preparatory school or produce suitable proofs of a degree of instruction corresponding to the measure of instruction imparted by the same; it is also desired that they should have undergone a full term of apprenticeship in some branch of the art-trades.

'Outsiders' are such persons attending the school for a limited time or only a part of the instruction. They are admitted only to the special school, must produce proof of suitable preliminary instruction, have completed a term of apprenticeship, and be engaged in art-trade work.

The fees, which are payable in advance, amount to £1 10s. per half-year for the preparatory and special schools, and to 10s. for the evening school. 'Outsiders' pay £1 per term and foreigners £7 10s.

Dispensation from the payment of fees and small scholarships are granted to indigent pupils who have attended the school for at least one half-year and have distinguished themselves by talent, great diligence, and good conduct.

The scholarships are administered by the advisory committee of the school upon the recommendation of the Masters' Council.

The school is divided into two principal sections, the preparatory school and the special school. The former aims at imparting the measure of artistic and technical knowledge necessary for the successful prosecution of studies in the latter.

| Subjects of Instruction | Scope of the Instruction |
|---|---|
| Exercises: | 1. Freehand drawing from nature subjects.<br>2. Composition drawing from nature subjects in a limited time as introduction to drawing from memory.<br>3. Geometrical drawing.<br>4. Modeling simple articles.<br>5. Ornamental exercises, using prescribed or self-designed forms of ornamentation. |

THE SPECIAL SCHOOL.

| | |
|---|---|
| | Aims at imparting that measure of artistic and technical finish necessary for the successful prosecution of an art-trade branch, after completion of the school course. |
| Architectural class: | Designing and detail drawing for all parts connected with architecture and the arrangement of interiors. |
| Sculpture class: | Modeling figures and ornaments; plastic designs; stone-working; wood-cutting; stucco and cement-applying. |
| Chasing class: | Chasing; embossing vessels; making patina. |
| Class for flat and graphic art: | Designs for special techniques and given materials, such as weaving, ceramics, bookbinding, etc.; poster designs; lithography; wood-cutting; templet-making. |
| Class for decorative painting: | Exercises and designs in wall- and ceiling-painting. |
| Class for figure-drawing: | Drawing from animals, drapery from head and posed models; painting decorative still life. |
| Supplementary instruction: | Pose-drawing; flower and plant life; instruction in technical construction and style; perspective and shade construction; sign-writing and lett.r-printing. |
| Subjects: | Modeling in clay and wax; drawing from the nude, and anatomy; technical drawing for joiners and locksmiths; black and white exercises for decorative painters. |

## The composition of the staff of masters is as follows:

| Professors, Masters, etc., for | Number |
|---|---|
| Sculpture | 1 |
| Historical painting | 1 |
| Chasing | 1 |
| Decorative painting | 1 |
| Ornamental forms and designing of flat decoration | 1 |
| Ornamental plant-drawing, flower-drawing, and painting | 1 |
| Geometrical drawing, shading, and perspective | 1 |
| Anatomy and drawing from the nude | 1 |
| Freehand drawing, ornamental forms, and supervision of the library | 1 |
| Geometrical drawing | 1 |
| Flat and graphic art | 1 |
| Painting | 2 |
| Architecture | 1 |
| Moulding and forming | 1 |
| Total | 15 |

## The attendance for the scholastic year 1903–4 was:

| Department | Number of Pupils in Summer Term | Winter Term |
|---|---|---|
| Preparatory school | 30 | 49 |
| Special school | 67 | 96 |
| Evening school | 91 | 133 |
| Total | 188 | 278 |

These figures show that the attendance during the summer term is about one-third less than during the winter term.

Of the winter total of 278 pupils 109 were below and 169 above 18 years of age.

An analysis of the occupations of the 278 pupils gives the following results:

| Occupations | Number of Pupils |
|---|---|
| Architects | 71 |
| Sculptors, modelers in clay, workers in stucco | 34 |
| Book printers | 1 |
| Chasers, engravers, and modelers in wax | 14 |
| Decorative painters | 76 |
| Decorators | 2 |
| Garden architects | 1 |
| Glass-stainers | 8 |
| Gold and silversmiths | 3 |
| Workers in artistic door fittings | 5 |
| Art-trade draftsmen | 17 |
| Varnishers | .. |
| Lithographers | 9 |
| Masters | 1 |
| Painters | 6 |
| Porcelain painters | 2 |
| Photographers | .. |
| Carpenters, furniture draftsmen | 18 |
| Xylographers | 2 |
| Future drawing masters | 5 |
| Various | 3 |
| Total | 278 |

The following is a list of the subjects of the prize competitions for the year 1903–4:

| Branches of the Art Trades | Subjects of Prize Competition |
|---|---|
| I. Architects, cabinet-makers, art workers in metal: | 1. Simple sideboard.<br>2. Mural fountain.<br>3. Design for a summerhouse.<br>4. Design for garden furniture.<br>5. Interior of the reception room of the Director of an art-trade school.<br>6. Designs for banisters of wrought iron or of bronze.<br>7. Skylight grating. |
| II. Decorative painters: | 1. Mural decoration of a Protestant church.<br>2. Ceiling decoration of a sitting-room.<br>3. Passage decoration of a house upon the occasion of a golden wedding.<br>4. Painted frieze work of the garden dining-room of an hotel. |

| | |
|---|---|
| III. Modelers in clay: | 1. Design for a stone frieze.<br>2. Simple vase.<br>3. Tombstone. |
| IV. Modelers in wax: | 1. Set of table knives and forks.<br>2. Buckle of a girdle.<br>3. Set of writing requisities.<br>4. Set of smoking requisites. |
| V. Lithographers, draftsmen, glass-stainers, etc.: | 1. Money box.<br>2. Book title to 'Fairy Tales.'<br>3. Water jug.<br>4. Tile patterns.<br>5. Bill-posters.<br>6. Large earthenware jug.<br>7. Panels for cupboard.<br>8. Set of smoking requisites.<br>9. Knot-work carpet.<br>10. Ornamental heading and tail-piece of a pamphlet.<br>11. Set of wine glasses.<br>12. Cruet stand. |

The Düsseldorf art-trades school is still adding to and developing its scope of instruction. Special attention is now being devoted to drawing from the nude, to the study of plants, and to animal studies from nature. For the last-mentioned subject the pupils of the sculpturing class and of the divisions for flat and graphic art attend the Zoölogical Garden for two afternoons per week. These studies are considered to be of the greatest importance, as they school the eye to seize and retain the forms and movements of the animal world; they are supplemented by lectures delivered by the Director of the Zoölogical Garden.

The greatest stress during the past two years, however, was laid upon the alterations in the plan of instruction of the preparatory school, which is regarded — and rightly so — as the foundation of the entire artistic and art-trade education of the pupils. During a two years' course the preparatory school strives to give the students a general education embracing all branches of art-trade work, and in particular to make them acquainted with all forms of art-trade creative work.

In the opinion of the school authorities, the art-trade branches require at the present time not so much specialists with a limited field, as artistically versatile and generally

educated men capable of seeing beyond the limits of the narrow circumscription of their own particular branch. After undergoing a thorough course of instruction in the preparatory school, which also covers such subjects as construction, perspective, etc., pupils can decide more easily and with greater certainty as to the choice of the special art-trade branch to which they wish to devote themselves. To whatever branch their special talents and inclinations may impel them, the pupils will always regard their work as a branch in organic connection with other equally important branches, and not as a separate entity specially entitled to independent existence. They will acquire some idea of the harmony effected by the intermingling of all the arts, and will employ their influence after leaving school in the direction of the production of more purely artistic objects and surroundings.

The relations between the Düsseldorf school and the art trades of the town and district are of the most satisfactory nature. I was informed that the demand for pupils who have passed through the school often exceeds the supply. It is greatly to the credit of the school that they are unwilling to recommend pupils who have not completed the full courses, both in the interests of the pupils themselves and of the art-trade branches concerned.

The school building, which is situated on the bank of the Rhine, is large, spacious, and well-lighted, but does not seem particularly adapted to the purposes of instruction; the erection of new and more suitable buildings is contemplated.

The instruction given at the school is greatly facilitated by the presence of the Düsseldorf Industrial Museum, opened in 1896, which, although not one of the largest, is certainly one of the most practically arranged and best equipped in Germany.

The expenditure for erection and equipment amounted to £28,000, of which the State contributed £5,000, and in return exacted various privileges in order to gain some influence upon the construction of the building and its working organization.

The collections include textile fabrics, ceramic objects, wood-work, metal-work, drawings, charts, a library, and various other objects of interest to art-trade students and manufacturers. The collection of textile fabrics is especially fine and surpasses those found at the best textile schools, as it contains specimens of the textile fabrics of all countries and ages, with the exception of those of Greece, which are extremely rare. The specimens of cloth woven at Almeira, Lucca, Palermo, and Florence during the thirteenth, fourteenth, and fifteenth centuries are the finest and most complete in Germany.

The total number of objects amounts to over 20,000. Of these a large number have been presented and other purchased at an expenditure of £9,000. For the latter purpose an art-trade specialist was sent abroad for several years to make the necessary purchases at reasonable prices.

It is most noteworthy that one of the special objects of the industrial museum is the encouragement of the export trade of the art-trade branches, and that special facilities have been provided and agents appointed in foreign countries in pursuance of this purpose."

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The most important handicraft and art-trades schools of Prussia are as follows (the names will indicate to some degree the difference in the character of these, ranging from the art-trades school of Berlin or Düsseldorf to the wood-carving school in Warmbrunn):

In Prussia:

Bunslau.....Royal Ceramic Technical School.
Cassel.....Royal Art-Trades and Industrial Drawing School.
Hanau.....Royal Drawing Academy.
Höhr.....Royal Ceramic Technical School.
Königsberg.....Royal Provincial Art and Industrial School.
Aachen.....Industrial Drawing and Art-Trades School.

Barmen.....Handicrafts and Art-Trades School.
Elberfeld.....Handicrafts and Art-Trades School.
Erfurt.....Handicrafts and Art-Trades School.
Halle a. S.....Handicrafts School.
Hannover.....Handicrafts and Art-Trades School.
Magdeburg.....Handicrafts and Art-Trades School.
Altona.....Handicrafts and Art-Trades School.
Berlin.....First Handicrafts School.
Bielefeld.....Handicrafts School.
Breslau.....Handicrafts School.
Charlottenburg..Art-Trades and Handicrafts School.
Cologne.....Art-Trades and Handicrafts School.
Crefeld.....Handicrafts and Art-Trades School.
Danzig.....Commercial and Industrial School.
Dortmund.....Handicrafts School.
Düsseldorf.....Handicrafts School (technical school for handwork and industry).
Düsseldorf.....Art-Trades School.
Elbing.....Industrial School.
Essen.....Industrial School.
Flensburg.....Art-Trades School Technical School.
Frankfurt.....Art-Trades School.
Gnesen.....Commercial and Industrial School.
Hildesheim.....Handicrafts School.
Kiel.....Handicrafts School.
Solingen.....Technical School for the Steel Industry.
Trier.....Handicrafts and Art-Trades School.
Warmbrunn.....Wood-Carving School.

In Bavaria: Munich, Nuremberg, and Kaiserslautern.

The art-trades schools in other portions of Germany are as follows:

In Saxony: Leipsic, Dresden, and Plauen.
In Württemberg: Stuttgart.
In Baden: Karlsruhe and Pforzheim.
In Hesse: Darmstadt, Mainz, Offenbach, Worms.
In Oldenburg: Oldenburg.
In Weimar: Weimar.
In Alsace: Strassburg, Hamburg.

## CHAPTER XI

# TEXTILE SCHOOLS

THE first technical schools for the textile industry were the spinning schools, erected in great numbers in the eighteenth century and in the first half of the nineteenth century for the improvement of hand-spinning. With the decline of hand-spinning, on account of the introduction of mechanical spinning-machines, these schools gradually fell away. Instead of these, attention was then turned to the promotion of hand-weaving, which it was hoped might be made efficient by perfecting the technique of the workers and by introducing more difficult weaving in artistic designs over against the mechanical weaving which at first limited itself to simple styles of material produced on a large scale.

For this purpose a large number of weaving schools have been organized since 1830, of which the most important are the ones at Elberfeld (1844), Mülheim on the Rhine (1852), in Prussia; Münchberg in Bavaria (1855); Reutlingen in Württemberg (1855); and Chemnitz in Saxony (1857). In accordance with their aim, the instruction in these schools extended only to hand-weaving and, of course, to the technique of weaving, as well as to model-drawing or designing. In Elberfeld a chemical department was erected for coloring, stamping, bleaching, and manufacturing colors and drugs, but this department was poorly attended from the very beginning.

When mechanical weaving had advanced further and had begun to include the preparation of the finer kinds of yarn and the production of artistic materials, hand-weaving in the schools declined. It became necessary to give greater attention to the study of mechanical weaving in addition

to design, the importance of which was still not fully appreciated. At first this instruction was given only by lectures. With the advance in technique, the need of practical instruction was better appreciated, as the factory-owner, on account of increasing competition and specialization, could give less attention to the systematic and thorough training of his apprentices. In consequence of this, all great weaving schools now are equipped with mechanical looms of different kinds.

The weaving schools are divided into higher or lower institutions, according to their aim. In a few poor regions, especially in Silesia and Saxony, where hand-weaving is still maintained to supplement other occupations, there are a few teaching institutions, usually called weaving school workshops, which, by means of a simple, but most practical instruction, provide assistance for these house industries. Similar institutions exist in Hannover, where weaving as a house industry has formed for a long time a helpful if not a very important side-employment for the country people.

The textile industries, like all other branches of industry, have been compelled to take into consideration in the textile schools the principle of division of labor, which is perhaps especially powerful in the textile industries. It became more and more impossible to solve the problem placed upon the weaving schools, of giving adequate instruction in all branches of the weaving industry. Prussia, followed by other states, has limited the field of work of the individual institutions, which now take into consideration only those branches of the textile industry which are home industries in the place where the school is located or in its immediate surroundings. Other branches of the textile industry are taught only so far as they fit into the special work of the school and can be carried on with their existing organization. Special schools for the woolen, linen, cotton, and silk industries have been organized where local conditions demanded them.

The needs of other branches of the textile industry have

gradually been taken into consideration on account of the increased demands upon the technical knowledge and dexterity, as well as upon the good taste, of the workman. In the textile schools there are now divisions for spinning, rope-making, coloring, finishing, embroidering, lace-making, hand and machine embroidery, and making of undergarments, cloaks, and mantles; or special schools have been created for them.

## CHAPTER XII

# TECHNICAL SCHOOLS FOR THE WOOD-WORKERS

THE technical training of carpenters and joiners in the theory of materials, construction, drawing, cost estimates, etc., is seen in its best form in the building-trades schools. Outside these schools all handicrafts and art-trades schools, as well as the greater continuation schools, contain special departments for joiners and cabinet-makers, turners, and other wood-workers, in which, as well as in the guild schools for wood-workers, training in drawing is provided.

The first independent technical schools for wood-working (Schnittschulen) were established in the great forest territory of Bavaria. They have been models for other similar schools elsewhere.

As early as the year 1838, the Bavarian authorities had considered granting assistance to the wood-carvers in Berchtesgaden and Oberammergau, by means of education, especially by instruction in drawing. It was hoped in this way to promote the production of more artistic work. The wood-carving which had been carried on there for centuries had fallen into decay because of unfavorable tariffs and other conditions. A technical school, with of course only a loose organization, was decided upon in the year 1858. In two poor rented rooms with one teacher the work of instruction in wood-carving was begun.

The institution received its first definite organization through a program of work provided February 21, 1866. Instruction in elementary drawing in two classes, each with two divisions, was provided for modeling, and later wood-carving from drawing and models was added. Practice in reading, writing, and arithmetic was usually provided

to fix and extend the work of the elementary school. A model workshop was added to the school, in which, under the guidance of the teacher, articles were prepared for sale, the teacher being responsible for the proceeds. He was required to furnish the materials for the work, and to pay the pupils for their work. A pupil could not work in the workshop longer than four years. The instruction was free.

In the year 1884, there was added to the school an exhibition hall, which stood open to visitors from the middle of June to the middle of September to permit the public to see the work of the pupils. This exhibition of pupils' work in the hall enabled them to submit the course of instruction in the school to public opinion. Pupils in the third and fourth years were permitted during the hours of work to prepare, under the inspection of the teacher articles for sale outside the country. A council, composed of twelve members for the supervision of the school, undertook to secure for poor pupils the profits of their work. Out of this plan in the course of years a comprehensive business has developed.

According to the present constitution of the school, which has been in operation since 1884, the course of instruction includes preparatory courses in drawing, with four hours a week for elementary school pupils in two divisions, and a regular course with three divisions for regular students. The subjects of instruction are: drawing from models, mathematical and technical drawing, modeling in clay and wax, molding, and carving from models. The number of hours' instruction per week is fifty, of which thirty hours are given to carving in the first and second division, and thirty-eight hours in the third division. The apprentices' course is four years long; and evening and Sunday instruction is given in the school. A collection of plaster of paris and wood models, of drawing models, graphic work, and a few antiques stands at the disposal of the school as a part of the educational equipment. There is an affiliated school of drawing in Schellenberg, where on Sundays instruction is given by an elementary teacher

under the supervision of the head of the carving school. A great number of similar institutions have arisen, built on the model of the school at Berchtesgaden, sometimes, of course, with broader programs of work, which take into consideration not only wood-carving, but the manufacture of furniture, turning, and sculpture.

The industrial wood-workers of the region were at first defiant, even hostile, to the institution, which they thought was likely to aggravate their embarrassment by unduly increasing production, but to-day they are almost unanimous in recognizing the usefulness of these schools, and dispute for the honor of taking part in their organization.

## WOODWORKING SCHOOLS IN GERMANY

In Bavaria:

Bischofsheim on the Rhine (in the year 1861 removed from Poppenhausen, where it was founded in 1853);

Partenkirchen (founded in 1869 and united with an art cabinet-makers' school in 1899);

Oberammergau (where, for the purpose of promoting wood-carving, practical wood-carving was taken up in the drawing school founded there in 1834);

Neuhammer (1884), Kötzling (1897);

Furth, where an institution was erected in order to support the important industries represented there (cabinet-making, sculpture, and turning).

In Baden:

The technical school for turners and wood-carvers.

In Leipsic:

The wood-carvers' school at Warmbrunn in Silesia.

In Flensburg:

The technical school for art cabinet-makers and wood-carvers;

In Berlin:

The cabinet-makers' school.

The basket-makers' schools constitute another kind of wood-carving school. These were founded in the second

half of the nineteenth century in Prussia, Bavaria, and Baden, for the betterment of the technique and for the elevation of the taste of persons in the basket-making industry. The most important schools are in Heinsburg, in the Rhine province, and at Lichtenfelds in Bavaria. The straw-plaiting schools have been organized in different mountain regions, first in Odenwald (since 1845), later in Saxony, and in the Black Forest, where the manufacture of straw hats has gone on for a hundred years.

## CHAPTER XIII

# TECHNICAL UNIVERSITIES

(TECHNISCHE HOCHSCHULEN)

THE technical colleges stand at the head of the system of industrial and technical education in Germany. These schools are practically great scientific universities, which give the highest possible training in the sciences, and apply them to the industries. They are great schools for engineering, architecture, chemistry, and general science. At the present time, there are eleven such institutions in Germany:

| | |
|---|---|
| Brunswick, founded in | 1745 |
| Berlin, founded in | 1799 |
| Karlsruhe, founded in | 1825 |
| Munich, founded in | 1827 |
| Dresden, founded in | 1828 |
| Stuttgart, founded in | 1829 |
| Darmstadt, founded in | 1868 |
| Aix-la-Chapelle, founded in | 1870 |
| Hannover, founded in | 1879 |
| Danzig, founded in | 1904 |
| Breslau, founded in | 1905 |

The largest of these schools is the one in Berlin, located in the suburb, Charlottenburg. It traces its origin back to the old Royal Architectural Academy, founded in 1799, to which a technical institute was added in 1821. In 1879 the two institutions were converted into the present technological institution. The other technical colleges have modified their schemes so as to conform in general to the Berlin type. The appended programs of Berlin and Karlsruhe show the differences in their courses of study.

The United States Commissioner for Education in a report for 1897–98 says: "The new universities (technische

hochschulen) thus developed have the purpose of affording higher instruction for the technical professions in State and community service, as well as in industrial life, and have cultivated science and art, which are intimately connected with the field of technology. They prove themselves equal to the university in the following points: they claim from their matriculated students the same preparatory education required by the old university, namely, nine years at a classical high school; they grant and insist upon perfect freedom in teaching and learning, and are under the direction of electors elected for one year instead of having principals chosen for life, as in secondary schools."

The Berlin institution is organized in five departments:

| | | |
|---|---|---|
| I. | Architecture | 4 years |
| II. | Civil Engineering | 4 years |
| III. | (*a*) Mechanical Engineering | 4 years |
| | (*b*) Electrical Engineering | 4 years |
| IV. | (*a*) Naval Architecture | 4 years |
| | (*b*) Naval Engineering | 4 years |
| V. | Chemistry and Metallurgy | 5 years |

The Karlsruhe institution is organized in six departments:

| | | |
|---|---|---|
| I. | Science in general | 2 years |
| II. | Architecture | 4 years |
| III. | Civil Engineering | 4 years |
| IV. | Mechanical Engineering | 4 years |
| V. | (*a*) Chemistry | 4 years |
| | (*b*) Pharmacy | 1½ years |
| VI. | Electrical Engineering | 4 years |

These universities are generally situated in places of considerable importance, and are not usually founded in cities having populations of less than 100,000 inhabitants. They enjoy at the present time an extraordinary prosperity and attract numerous students from other countries. No other institutions seem to have been more important in promoting the great industries of Germany. They illustrate Germany's patient toil and tenacity in seeking success in the industrial world by rational means and scientific methods. They are institutions devoted to the adaptation

of science and education to the necessities of economic life. Emperor William takes a very active interest in them. At the inauguration ceremony for the school in Dantzic, October 6, 1904, after praising the magnificent installation, he expressed his determination "to increase the number of these schools," because of the importance of the departments of technical science in the struggle among the nations for industrial supremacy.

The following table shows the attendance at these schools through a period of years, and also shows their continuous progress:

| Years | Number of Pupils | | | | | |
|---|---|---|---|---|---|---|
| | Universities Classical | Universities Technical | Schools Forestry | Schools Mining | H. Schools Veterinary | H. Schools Agricultural |
| 1870 | 13,673 | 2,928 | 261 | 144 | 267 | 357 |
| 1873 | 15,201 | 4,163 | 317 | 168 | 271 | 298 |
| 1876 | 16,726 | 5,449 | 269 | 264 | 284 | 269 |
| 1881 | 21,210 | 3,377 | 394 | 262 | 436 | 353 |
| 1886 | 27,265 | 2,549 | 394 | 344 | 735 | 468 |
| 1889 | 29,057 | 2,887 | 386 | 343 | 962 | 483 |
| 1892 | 27,398 | 4,209 | 255 | 389 | 1,047 | 694 |
| 1897 | 29,476 | 7,747 | 330 | 523 | 1,140 | 1,070 |
| 1900 | 32,834 | 10,412 | 278 | 763 | 1,343 | 890 |
| 1910 | 52,851 | 16,072 | 342 | 788 | 1,315 | 1,861 |

In 1870, the ratio of the number of students of the classical universities to that of the technical universities was four and one-half to one. In 1900, it was a little more than three to one. The number of technical students has increased more rapidly than that of classical students. If one limits the comparison to the period from 1889 to 1900, the time during which German industry took the first place on the continent, the figures are still more eloquent. The classical students have passed from 29,057 to 32,834, an increase of 13½ per cent, while the technical students have passed from 2887 to 10,412, an increase of 264 per cent, without including the irregular students. Statistics published in September, 1907, by the Ministry of Public Works give for the year 1903 the number of technical students as 13,464. From this it appears that in the three years from

1900 to 1903 the increase was even greater than in the three years immediately preceding.

The ratio of pupils to professors is always small. The average is:

| | |
|---|---|
| Prussian schools | 9 |
| Darmstadt schools | 16 |
| Dresden schools | 12 |
| Karlsruhe schools | 13 |
| Munich schools | 24 |
| Stuttgart schools | 9 |
| Brunswick schools | 9 |

## CHAPTER XIV

# FURTHER TRAINING OF INDEPENDENT HANDICRAFTSMEN

THE opening years of the nineteenth century saw the dissolution of compulsory guilds in Germany, and the beginnings of industrial freedom. With these came the great reforms and improvements called forth in all fields of work by the advance of natural science, and above all by the development of machinery and the perfection of means of transportation, by which competition with foreign countries, especially with England and France, was made easier. Out of all this development arose the deep conviction, even in the earliest decade of the century, that the further education of the independent industrialists was an absolute necessity. This educational problem was first undertaken by the industrial and handicraft unions which soon came into existence in all parts of Germany. One of the first of these organizations was the one founded by Beuth in Berlin in the year 1822 — the Union for the Promotion of Industry. This was followed by similar foundations in all the Prussian provinces, as well as in Hannover, Oldenburg, Saxony, Nassau, Hesse, and South Germany. The unions sought to attain their object through the dissemination of useful knowledge among their associates, by arranging for lectures, organizing technical libraries and reading rooms, publishing technical journals, collecting standard models, holding exhibitions, furnishing advice and instruction on technical questions, bringing together specifications and drawings of patents, and all such means. These unions work to-day in a similar manner, although they have partly lost their earlier importance, especially in North Germany, at first in consequence of the revival of the guilds, and later through the organization of Chambers of Trade and Commerce.

The authorities have sought to promote the independent activity of these unions by the founding of technological and industrial art museums, in which models of home and foreign manufacture are placed on exhibition, and new machinery and tools are shown in actual operation. The Royal Württemberg Central Station for Industry and Commerce, organized in 1848, has become a model for these institutions. Its constitution gives as the aim of the center the securing of useful models, tools and methods of operation, and their application to the home industries. Out of this center has grown the present National Industrial Museum. Other museums, modeled after the South Kensington Museum in London, have been established in Karlsruhe, Nuremberg, Berlin, Munich, Leipsic, Dresden, Plauen, Breslau, Düsseldorf, Cologne, Hannover, Hamburg, Frankfurt-am-Main, Wiesbaden, Crefeld, and other places. These, however, besides technological museums, include museums of industrial art.

The needs of the independent industrialists for technical and art-trade instruction are served further, especially in Saxony and South Germany, by public drawing halls — often united with the industrial schools — which are open on Sunday and on definite day and evening hours once or twice a week. A teacher of drawing is present to advise the industrialists about the preparation of the working plans required in their occupations. The close relations thus established between school and practice have been of immediate service to the industries. Such open drawing halls are found in the industrial school at Plauen (with a total attendance of 9,500 in 1899), in connection with the technical and industrial continuation schools of Munich, in twenty-eight Württemberg industrial continuation schools, in the great industrial continuation schools of Baden and Hesse, and in other places. Similar arrangements in the industrial continuation schools of Posen a few years ago proved themselves very helpful to the industries.

The older industrialists often wish to share in the instruction of the technical schools. In the winter half-year of

1902-3, for example, a large number came to the Berlin Industrial Hall, a great continuation and technical school for metal-workers. The distribution of ages is interesting. There were 193 pupils from 21 to 25 years of age, 101 from 26 to 30, 26 from 31 to 35, and six above 35, of whom four were between 42 and 48.

A new form of further training for industrialists may be seen in the so-called "masters' courses," which were first introduced in Baden in the year 1884 in order to give the masters an opportunity to learn of the advances in their industry, especially of new processes and methods of investigation. The suggestion came from the Chemical Technical Testing and Investigation Institute in the Technical University in Karlsruhe. At first, the technical investigations were carried on in a severely scientific way. Later there was added purely practical work, which in the course of time has nearly supplanted the earlier methods. The first courses were for soap-boilers, tanners, and dyers. The soap-boilers were instructed in simple methods of investigating the raw and auxiliary materials to be used in the industry, as well as in methods of production — partly by lectures, partly by practical work. Instruction for the tanners was divided into a theoretical and a practical part. The former comprised discussions about the structure of animal hides and explanations of the chemical and physical processes used in tanning and of the use of tanning materials. The practical instruction consisted of practical exercises in tanning. For the dyers, lectures were given on the composition of fluids, plant and animal fibers and their peculiarities, coloring materials, tanning materials, and soaps. The lectures were illustrated by practical work in the tanneries.

Courses for persons engaged in installing gas and water plants came next. These include the economics of gas lighting, the operation of engines, the handling of the material used in the manufacture and piping of gas, gas-meters, devices for regulating pressure, apparatus required in connection with the use of gas for lighting, heating, and power; the requirements of good drinking-water and ways of

securing it, the conveying and measuring of water, apparatus for various applications of water, the care of water-pipes, especially in winter; estimates of cost, inspection of plants for water and gas, installation, and practical testing of raw materials.

The government also provides courses for watch-makers, workers in etching and ornamenting metals, locksmiths, electrotechnical mechanics whose business is the installation of electrical wiring and the placing and examination of lightning-conductors; shoemakers, who study the anatomy of the foot, and the production of plaster of paris models: painting — different kinds of painting, newest technique of painting, different colors, their mixing, the permanency of color, poisonous qualities, methods of testing, adulteration, wood and marble painting; upholsterers; tailors — measuring, cutting, making of models and patterns: cabinet-makers — polishing and planing, coloring of furniture, staining of wood, inlaying; manufacture of pottery.

All these courses are not given every year, but according to the demand for them. Between the years 1884 and 1897, inclusive, there were given two courses for soap-makers, one for dyers, four for tanners, four for shoemakers, six for upholsterers and saddlers, nine for tailors, two for cabinet-makers, nine for painters, two for watch-makers and refiners of metals, three for jewelers, two for gas and water installers, seven for electricians, etc. The length of these courses varied from five to fourteen days. The entire attendance upon all courses in this period of time amounted to over eight hundred. The number of those in each individual course averaged about fifteen; the most popular courses were those for gas and water installers, painters, upholsterers, tailors, and electricians. In the year 1902 there were given two cutting courses for master tailors (each of twelve days, with a total of eighteen persons in attendance); one course for master painters, in wood and marble painting (twelve days, fifteen in attendance); two courses for master cabinet-makers in each of two

divisions (first division, polishing of furniture, each course three days with twenty in attendance; second division, veneering and recoloring of wood, each three days with twenty-six in attendance); two courses for the arranging of electrical equipment for houses and commercial establishments, and plans for the installation of lightning-conductors (each six days, thirty-one in attendance); one course for saddlers, in the manufacture of horse-collars (twelve days, ten in attendance); one course for workers in ceramics (three days, fourteen in attendance).

Almost all the courses were given in Karlsruhe, usually in the rooms of the National Industrial Hall and under its direction. The courses for dyers were conducted by the Chemical Technical Testing and Investigating Institute, which besides this took part in the course for tanners. The course in galvanic refinement of metals was held at Pforzheim in the institute for testing the finer metals. The cost of the trip to attend the course was refunded to all masters who were unable to meet the expense, and a small daily allowance was granted in some cases out of the State treasury.

While the courses just described had as their aim the technical instruction of the industrialists, other courses for further training in business methods, and especially in arithmetic, were provided. Many handicraftsmen were not equipped to take charge of a set of account books or to draw up an estimate of cost, even in the simplest way. In the year 1891, therefore, the Ministry of Baden employed an industrial teacher to prepare a very easily understood manual of simple industrial bookkeeping and cost calculation, for the use of industrialists, and furnished about two thousand copies free of charge to the industrialists, guilds, unions for the education of workers, and other industrial associations of the country, with the request that they consider the establishment of practical courses in bookkeeping. In order to encourage still further the holding of such courses the Government undertook wholly or partly

to pay the salaries of such teachers as asked compensation for their services.

The action of the authorities in regard to these courses was very popular in the circles concerned, and during the course of the next year courses in book-keeping and cost calculation were given by all the industrial unions of Baden. Since this time, instruction in book-keeping and calculation is usually included in all technical courses.

The policy of the Ministry of Baden was imitated in Württemberg, where the authorities, besides providing for the Central Station for Industry and Commerce, organized with the help of the industrial unions itinerant courses for industrial bookkeeping, correspondence, calculation, exchange, etc., in thirty cities. The industrialists, with the wives and daughters of the officials, merchants, and artisans, took part in these courses. The Austrian courses, which were first given in the Technological Museum in Vienna and afterward in other places of the Monarchy, such as in Reichenberg, Prague, Brunn, Graz, and Innsbruck, differ from the Baden and Württemberg courses in this respect — the Austrian system aims not only at the instructing of masters in special technique, but also at the building up of the entire technique of a handicraft. This system, therefore, includes comprehensive practical instruction in schools equipped with the newest and most up-to-date machinery and tools. The Vienna course not only lasts longer than the Baden one, but demands a more expensive teaching faculty and a more complete equipment, which is also very much more expensive.

The master-courses of Vienna have served Prussia as a model. In the Prussian budget for 1900, the sum of 97,000 marks was appropriated for the organization and support of master-courses, and for exhibitions of machinery and tools for the commercial industries of Hannover and Posen. In the next budgets still further appropriations were made, especially in the budget of 1902, which provided for the establishment and maintenance of courses in Cologne. The

courses in Hannover and Posen were opened in the beginning of 1901; the one in Cologne in the fall of 1902. In them, shoemakers, tailors, smiths, locksmiths, joiners, and cabinet-makers were trained in technical drawing, commercial arithmetic, calculations, knowledge of materials, bookkeeping, and principles of law, and above all, in practical work in workshops organized especially for this purpose, and equipped with the newest power, machinery, and tools. At the same time, by means of excursions, those in attendance became acquainted with model business plants of different kinds.

Permanent exhibitions of all sorts of raw materials, half and fully manufactured materials, tools and special sorts of work, and motors and machines, mounted and ready for use, are found in many cities. Skilled directors of these institutions are always at hand to give information concerning the capacity of work of these machines and their consumption of materials, as well as how and where to procure them. These directors with their assistants also conduct the master-courses. In these courses are usually about ten masters and older journeymen. The masters have the preference, but any vacancies are given to the journeymen who are most likely soon to become independent masters. The majority of those attending these courses receive some pecuniary support, contributed by the State, province, city, and chamber of commerce.

Where there is a permanent industrial exhibition, as in Hannover and Cologne, the directors are also in charge of the technical courses. The teachers are experienced masters of the subject taught in several courses. The work is inspected by special commissions consisting of representatives of the State, of the province, of the city in which the course is given, and of the chamber of commerce and trade of the province, as well as by the directors of the course. The Prussian government contributes liberally to the support of these organizations and courses. The appropriation for 1908 for the eight great institutions giving master-courses amounted to 767,698 marks; for shorter courses

for the same year 40,790 marks; for special master-courses held in the technical schools 32,261 marks. The Government also contributed to the support of exhibition halls the amount of 142, 246 marks. In addition, considerable money was contributed for the promotion of associations of small industrialists for the purchase of machinery and raw materials, and for providing exhibitions of the work of apprentices.

The Prussian scheme is more comprehensive than the one in Baden, and calls for more time, the greater master-courses requiring at least from four to six weeks. Prussia gives also shorter courses for masters, lasting from ten to fourteen days, for the purpose of teaching special technique, but only masters are admitted. In addition to this, special courses are given in many of the great secondary schools. Altogether, there are many thousands of older workmen who are provided with an opportunity of perfecting themselves in technique. The cost is borne by the State, and the workmen often receive traveling expenses and wages while they are engaged in this work.

Short courses without practical work are sometimes instituted by chambers of trade in the special industrial schools. The aim is to teach bookkeeping, calculation, commercial arithmetic, and other commercial subjects on the theoretical side, with here and there a little instruction in special technique, such as decorative painting, model drawing, and measuring and cutting for shoemakers and tailors. The business courses are often attended by wives and daughters of masters who assist their husbands and fathers in business.

Within the last few years there have been established in Prussia extensive institutions modeled after the Department for the Promotion of Handicrafts in Vienna. The ones at Cologne and Dortmund are especially interesting. In Cologne a building has been provided at a cost of 600,000 marks. In this building are held the master-courses for tailors, shoemakers, cabinet-makers, and locksmiths, each lasting eight weeks. There also are given short courses for

masters, usually only about two weeks in length, as well as courses whose duration is not exactly defined. Lately, longer courses have been provided in the installation of water, gas, and electricity, the science of heating, plumbing, and coppersmithing. Some of these courses are three or four months in length. In other courses small handicraftsmen are taught the principles of association. In these courses the workmen are informed about the Prussian laws governing such associations, the best methods of organization, and the advantages to be gained through union. Such associations of handicraftsmen are formed in Germany for the purpose of securing machine tools, purchasing materials at wholesale, and selling the products.

A very interesting feature of the institutions just described is the exhibition of machinery, which is provided by manufacturers and installed in a great hall ready for use. In the industrial hall of Cologne one hundred and forty-two manufacturers have their machinery on exhibition, including all kinds of small tools, machine tools, and models, suited for use in shops of small and medium size. Skilled men are at hand to set the machinery in motion, and to explain its operation to visitors, and workmen in the courses held in the institution are given instruction in the use of these machines. Manufacturers find it to their advantage to submit their machinery to the test of the institution, and to the inspection of the visitors. More than fifty thousand people visited the Cologne exhibition in the space of two years.

In connection with such institutions bureaus are often established for communicating information and giving advice to handicraftsmen about new methods, new machinery, and the organization of associations. This advice and information are given without charge. Usually a good library of technical books will be found, with reading-rooms for the use of visitors and students. Lectures by technical men are given at regular intervals, some at the institution itself, and many in other parts of the province. In connection with these institutions itinerant teachers are provided

who go from place to place giving instruction in the handicrafts. It is apparent that Germany is not willing to see the great factories entirely supplant the handicrafts.

Many of the other states of Germany have provided master-courses and other means of advancing the education of the handicraftsmen. The courses, usually two or three weeks in length, cover a large number of subjects. Some of the courses in the art-trades are especially interesting. Such courses are given in connection with the Bavarian Industrial Museum, in Nuremberg, where they have a permanent exhibition of machine-tools and other equipment. The art-trade courses generally last a month, and are combined with workshop instruction. This provides a comprehensive theoretical and practical training for the masters. Not only ordinary instruction in drawing is given, but systematic artistic training. Such training classes presuppose that the industrialists have already acquired considerable skill in drawing. The aim of the advanced courses is to deepen the feeling for the artistic in production, and to suit the forms of decoration to the material and purpose of the object decorated. In some of the museums an effort is made to develop systematically the taste of the public. In connection with the Nuremberg Museum the merchants have built a shop which handles the products of the Nuremberg art tradesmen. No article produced in the art-trades is sold unless it has been approved as worthy of the museum.

There has been a feeling in some quarters that the efforts to advance the handicrafts by means of art training and instruction in the use of machine tools and motors is sure to fail; that, for example, factory methods of production have come to stay. Prof. Bücher of Leipsic, in a chapter devoted to the subject in his book, "Evolution of Industry," concludes that in many places and many industries such efforts are useless. He admits, however, that the smaller handicrafts have more than held their own in large sections of Germany and Austria. On the other hand, the men in charge of the great industrial plants have come to look with more favor upon the efforts made to educate the

individual handicraftsman. A large percentage of the skilled workmen in the great factories must come from the handicrafts. The money that is spent for promoting education in the handicrafts is to a considerable degree money spent for the advancement of the industries in general. A recent study of the question shows, however, that the proportion of skilled workmen in the great factories who come from the handicrafts is decreasing. The great factories are finding it necessary to train their own skilled workmen, by factory schools and in other ways. The outcome of the present situation is extremely uncertain. It seems clear, however, that the efforts to promote the education of the individual craftsmen have contributed largely to Germany's industrial success during the last twenty-five years.

## THE PROMOTION OF HANDICRAFTS IN AUSTRIA

The modern inventions of machine tools of various sorts and of gas, benzine, and electric motors have furnished sources of motive power that make possible less highly centralized methods of production. For example a small steam engine uses about four kilograms of coal an hour to one horse-power, while a great steam engine of one thousand horse-power consumes only 0.5 of a kilogram of coal an hour to one horse-power. Economy in production, under these circumstances, of course compels workers to unite in great organizations, and to buy materials and sell products by wholesale methods. The small gas, benzine, and electric motors, however, work almost as economically as the greater ones; and, thanks to the divisibility of the electric current, they furnish a cheap and convenient source of power for the smaller industries. Then, too, a large number of machine tools are now available for the small shops and are suited to their needs. These machine tools do not destroy the rich treasures of skill in handwork, but conserve it by freeing it from unnecessary drudgery and

by furnishing opportunities for new forms of skill. A way thus seems to open for assisting these smaller producers, an opportunity which has been utilized in Austria by the Department for the Promotion of Crafts. A consistent and systematic effort has been made during the past eighteen years to furnish the smaller industries means of production that will give them a fair opportunity of competing with the factory. This, of course, is possible only where there are natural resources of power and skill that can be drawn upon.

It has been said that "Austria is a museum of obsolete forms of production." This is true in some portions of the empire. In the Bohemian forests and in the Alpine lands you can find forms of hand labor that date back to the Middle Ages. You can, of course, find different conditions in other places. The Austrian census of those employed in the industries for the year 1902 showed 1,317,116 persons employed in small industries: less than ten persons in 587,677 shops or plants; 11,704 plants of middle size employing from eleven to twenty persons; 30,428 large plants employing more than twenty persons. Germany, with about twice the population, has 35,774 plants of middle size, a much better showing than Austria makes with its 11,704 plants. There is a general feeling in Austria that something should be done to build up this middle-class industry; and the creation of the Department for the Promotion of Crafts is one of the direct results of this feeling.

The necessity of a better mental and material equipment for those engaged in the industries has led to the founding of numerous industrial schools in Austria, to the devoting of greater care to the management of the continuation schools for apprentices, and finally to State action in the organization of the present department, which is at once a source of educational and of material aid to those engaged in the smaller industries.

In 1891 the Ministry of Commerce provided an appropriation of twenty thousand kronen for the promotion of the smaller industries or crafts. In the following year a

commission appointed by the ministry discussed the best ways of spending this appropriation. They finally left the carrying out of their plans to the Technological Museum of Vienna. At the same time the ministry provided for a council to have general charge of this work. Since 1898 there has been a special department of the Ministry of Commerce which has devoted its time to carrying out the plans of the council. In the year 1908 the whole service was transferred to the newly created Ministry of Public Works, and the Department for the Promotion of Crafts was organized.

There are two general divisions of the work of this department; one educational — instruction in technical and economic subjects; the other material — providing assistance in the way of machine tools, motors, and loans of money to those engaged in the smaller industries. In both, the department means to offer help only as a means to "Self-help" — the motto of the institution. As a school, it teaches workmen up-to-date methods of doing work; the best machine tools and how to use them; the best ways of supplying, using, and caring for materials; the best ways of running a small business, including the technique of production and the sale of the product; and, perhaps most important of all, the value of co-operation.

The department also interests itself in the formation of associations of commerce and of industry, assists them in laying out good industrial or business plants, supplies industrial machinery to them on long-time loans without interest, grants them small loans of money to stimulate their enterprises, and assists them in securing large commissions or orders for work, especially for the Austrian army. A new service, recently created for looking after the loans to craftsmen, remains in the central institution in Vienna and acts in harmony with it. It is now proposed to ask craftsmen to pay interest on machines furnished, as the department aims to give nothing away but advice and education. The present practice of furnishing tools on long time without interest is a violation of their motto, "Self-help."

The department acts in harmony with all organizations in Austria which interest themselves in the promotion of the crafts and assists such institutions with small grants of money. Examples of such institutions are the Industrial Museum in Brünn, the Technological Museum in Prague, the Institution for the Advancement of Commerce and Industry in Innsbruck, the Institution for the Advancement of Commerce and Industry in Cracow — in all, about twenty institutions. The task of all is to change the obsolete methods of work into up-to-date forms of production and sale, and to do this by stimulating self-help by means of education and by furnishing material assistance.

The central institution in Severingasse 9, Vienna, includes offices for the officials of the department, workshops for the model courses, and halls for exhibitions of tools and machines. The main hall is about eighty feet square and has an anteroom with about one thousand square feet of floor-space. These two halls serve as a place to exhibit materials, tools, and machines of all sorts which are especially useful to smaller shops, as well as investigating stations for testing the machines furnished to the association out of the funds of the department, and machine tools and mechanical contrivances exhibited by manufacturers who are looking for sales. Here are carried on investigations in the management of motors of various sorts, their special uses, value, and consumption of power. The department encourages manufacturers to exhibit their wares by supplying them with floor space, by furnishing most of the expense of installing them, and by providing the power transmission and motive power free of charge.

Visits to the machine halls are encouraged, and no entrance fees are charged. About twelve thousand persons visit them every year. Bodies of workmen who give notice of their visit have a special guide provided for them. Handicraftsmen of limited means, living outside of Vienna, will be granted an allowance to enable them to visit the machine halls if such a visit seems desirable. If the visit is for the purpose of learning the best methods of using the

machines exhibited, information will be given by a specialist from the department.

Special exhibitions are given from time to time in the machine halls. In the year 1906 there was given an exhibition showing the technique of tempering steel, with seventeen thousand visitors; in 1907-8 an exhibition of handicraftsmen's technique, with twenty thousand visitors. These exhibitions offered opportunities for improvement to small craftsmen, whose visits were made easier by the granting of allowances for expenses. Special lectures and practical exercises in the use of the machines exhibited were united with the exhibitions. Information and advice were given freely with reference to the motors and machine tools exhibited in the halls; also instruction in up-to-date methods of production and the supply of raw materials. Advice was given with reference to the building of workshops and the founding of associations. The machines exhibited were from all countries, Austria of course being favored. Twenty-one exhibitions have been held in other parts of the empire, some of the exhibits being transferred from the central institution in Vienna, the remainder being contributed by the local organizations. Exhibitions were also made of the work of this department in the World's Fair in Paris in 1900, in the exhibition in Cork in 1902, in Cracow and Trieste in 1904, and in London in 1906.

The department endeavors to provide special advanced technical and business training for ambitious handicraftsmen. Methods must be employed entirely different from those used in the training of apprentices, as the training required involves not only the use of tools and mechanical contrivances but knowledge of better ways of conducting a business of moderate size. This demands knowledge not only of technical but of economic progress, which must be communicated to these men under special and practical conditions.

The department, therefore, conducts model courses which aim at making the workmen familiar with the best industrial tools and machines, with a well-arranged shop,

with the latest technique of handwork, and with instruction in bookkeeping, business arithmetic, and other special subjects. It strives to arrange its work in these subjects so as to present a picture of the economic unity and system which will be found in a well-conducted workshop. These courses are, in respect to their materials and management, models of a business of middle size, in which, in addition to the regular department officials, the visiting masters and workmen must each take part. The workers will complete their technique in handwork in these courses and, at the same time, learn to manage a business in a scientific and economical way.

At the present time there are eight such model business shops or courses in the central institution in Vienna: namely, for shoemakers, tailors, cabinet-makers, electro-platers, electric installers, bookbinders, sheet-iron workers, and plumbers. Other courses are in preparation. These courses run from six to twelve weeks; and, as the workmen called in are deprived of an opportunity of earning wages, the needy ones receive an allowance, which amounts to twenty kronen a week for masters and seventeen kronen a week for journeymen, in addition to the cost of transportation to Vienna and back. Provision is made for handworkers who wish special instruction in the use of some particular mechanical contrivance, and also for persons who need a longer period of preparation than the normal one. Up to 1909 there had been 245 work courses with 3,932 participants:

| | Courses | Enrolled |
|---|---|---|
| For shoemakers | 74 | 1,215 |
| For tailors | 67 | 1,109 |
| For cabinet-makers | 47 | 635 |
| For locksmiths | 32 | 377 |
| For carpenters | 6 | 389 |
| For electro-platers | 11 | 124 |
| For electric installers | 4 | 43 |
| For lightning-rod men | 3 | 28 |
| For bookbinders | 1 | 12 |

The model courses serve also as experimental workshops. Such shops must keep pace with the technical progress of the industry for which they are instituted and must utilize, so far as possible, such progress themselves. They must interest themselves in the investigation of materials, and must prepare models, sketches, and drawings. This last phase of the activity of the department has assumed great proportions in the past few years.

The department arranges for courses of lectures for the workingmen and excursions to manufacturers' establishments in the large cities of Austria. Special masters and foremen in the different crafts accompany the teachers in these traveling courses and are employed in practical demonstrations. The department has such courses conducted for shoemakers, tailors, cabinet-makers, coopers, locksmiths, electric installers, and stonemasons — in all, five hundred and twenty-five courses, with eleven hundred and fifty members. Technical and economical subjects which are of interest to the tradesmen are discussed either by the officials belonging to the department or by specialists taken from outside.

A partial list of the subjects discussed in these lectures is as follows: Bakers' machines; the carpenter's trade at this period; the development of women's hats from the beginning of the eighteenth century to the present time; bookbinding; the art of graining and marbling; the shoe-last; gas and benzine motors; plumbing in America.

Sometimes the department undertakes the conduct of a series of lectures in order to make the masters more thoroughly acquainted with the industrial novelties than they could be by a single lecture. The department also prepares lectures for the general public, with the aim of giving the technical knowledge of products which the consumer should have in order to form a correct estimate of their value. The department believes that it is not sufficient to train workmen to produce goods in better ways and in more highly artistic forms; you must also teach the consumer to appreciate the better and more artistic forms and lead

him to make his choice after considering quality as well as price. One of the topics discussed at a recent meeting of the officials of this department was Production for Quality and The Education of the Consumer.

The production of goods at the present time demands cheaper and greater mechanical power than formerly, and must be carried on by the use of machine tools and motors. Handicraftsmen can not solve their problems in opposition to the general laws of economical life; they must make use of mechanical devices in their work. The department therefore strives to equip handicraftsmen with up-to-date tools and machines, requiring the craftsmen to pay back the cost of the equipment in installments without interest, the payments being extended usually over ten years.

To use such machines profitably they must be used constantly and the product must be disposed of in a business-like way. The department encourages the organization of unions or associations for the purpose of utilizing fully the common industrial plants. An additional reason for encouraging the formation of such associations is the enormous expense that would be entailed upon the Government if it undertook to furnish motors and machine tools to all the individual handicraftsmen demanding them — and the fact that this, too, would inevitably lead to overproduction. The department, for this reason, has interested itself in the formation of industrial associations for the common use of tools and machines. As these associations lack both technical knowledge and capital, outside assistance is necessary — first, for the supplying of industrial helps; and second, for industrial and commercial education.

These associations of workers consist principally of handicraftsmen of the same or related branches of industry. Their purpose is the common utilization of motors and machine tools in a special central workshop, where raw materials are partially worked over or prepared. The finishing of the product is usually done in the workshops of the individual members of the association, whose economical independence thus remains undisturbed. Such associations can be

formed only where there are sufficient numbers of handicraftsmen of the same industry who are disposed to unite themselves into an association. Where this is not the case, and where the necessity for the use of machines exists, another sort of association must be formed. This is the so-called machine association.

Machine associations are free unions of handicraftsmen that aim to secure for their members the use of mechanical helps, which will be set up in their individual plants and used in common by the members of the association. Such associations are especially important in places with a cheap electric current. The department will supply such associations once only under a contract for payment in installments; later, mechanical help must be cared for from the private funds of the association itself. When a little community undertakes the rôle of a machine association, trying to provide industrial helps for its handicraftsmen without profit to itself, the department will gladly furnish an equipment without the forming of a machine association.

As a result of the supplying of machines by this department, thousands of people in the industries are enabled to have the use of thorough industrial equipments suited to the production of goods in a competitive industry. In many cases these associations have developed into independent up-to-date business plants — flourishing cooperative institutions. A few examples may be mentioned here. The carpenters and cabinet-makers' association of Salcano produced wares in 1908 to the value of 1,262,776 kronen; in Mariano, to 165,885 kronen; in St. Veit, in Seiback, to 385,813 kronen; the workmen's association in the Stubaier small-iron industry in Fulpmes, to 554,542 kronen; the association of nailsmiths in Kropp, to 361,271 kronen; the workmen's association of shoemakers in Judendorf, to 14,600 kronen; and the stonemasons' association in Pucisce, to 211,676 kronen.

The members of these associations pay for the use of the machines, the sums paid being used for furnishing additional industrial helps to the members of the association. These

payments, amounting in some cases to a large sum of money, enable the association to provide itself with valuable industrial machinery. In a place where such a showing as the above cannot be made on account of smaller opportunities for work, the furnishing of machines has often enabled the handicraftsmen to establish their independence. They have not sunk out of their class, but have remained in independent business.

Of course, it is admitted at once that some of these experiments have been failures. The greatest prudence and technical knowledge can not always prevent the downfall of co-operative undertakings. There are certain circumstances that no council or administrator can influence or control. The number of industrial and commercial associations organized and partially supported by the department since 1892 is 282; 202 for the production of goods and eighty for selling or handling them. The value of the machinery taken back amounts to 256,300 kronen, or fourteen per cent of the value of the machinery furnished. Most of these returns took place in the early history of this movement. The returns of machines were almost always the result of the dissolving of the associations. The machines were not by any means a dead loss, as most of them were turned over to other associations after a fair discount for use — about seven per cent.

The business of furnishing these machines to associations calls for extraordinary prudence on the part of the department and for great care in following up with educational work. It is of little use to provide handicraftsmen with up-to-date machines, to make it possible for them to secure adequate capital, and then leave them to their own resources. The enterprise demands technical knowledge and economical judgment on the part of the men placed in control. Neither the ordinary course of industry, the training offered the handicraftsmen up to this time, nor the course of events of the last century, has contributed much to the development of such personal qualities. This technical knowledge and business judgment must be awakened; and

the result of the work of the department will depend finally upon the intellectual influence it will be able to exercise upon the handicraftsmen. The problem is an educational one, a problem bristling with difficulties and perhaps disappointments. In some way the department must provide technical and commercial education for a generation of men who will thus be qualified technically and economically to contend successfully against the supremacy of the factory. The department believes that this is a legitimate work for the government and that it can be accomplished.

The department has endeavored to utilize its educational opportunities at every step of the way. It has sought to advise these organizations, through its promotional work, as to methods of calculating the profitableness of enterprises; as to the best plans for erecting workshops; as to the best machines for given purposes and the best and most economical methods of using them. A workmaster is sent out from the department to conduct the installation of new machines and to instruct the members of the association in their use. Experts in bookkeeping assist the officials of the associations in introducing business books, give them advice about the control of the undertaking, and conduct the inspection of their plants for a time. The officials of the department always stand ready to assist the societies in carrying on their business.

As has been stated, the machines will be furnished by the Ministry of Public Works, to be paid for by installments in ten years without interest on the debt. These payments of the associations, up to the year 1909, were made to the finance minister. After 1908 they were placed to the credit of the Department for the Promotion of Handicrafts as a means of creating a permanent fund. This means, it is hoped, that the state will appropriate a constant sum for the use of the department; and that the department will have, in addition, after 1909, all the sums paid back by the associations, these amounting in one year to seventy thousand kronen. Two things are secured by this arrangement: First, an ever-increasing amount of money for furnishing

machines and other assistance; second, the moral responsibility of the associations is increased because, under this arrangement, every neglect on their part in making their payments to the departments means not only an injury to the fiscal interest of the country but also an injury to their own class of workers.

With the exception of the machine associations, all the industrial unions need a certain capital for carrying on the business, the amount of which depends upon the kind and extent of the association's undertakings. The unions are seldom in a position to satisfy this need from their own means. The system of credit for industrial enterprises is not much developed in Austria, although schemes for government credit associations have been discussed. The Ministry of Commerce in 1898 included, in its program for advancing the crafts, loans at a small rate of interest. As this year's estimate for both loans and machinery amounts to only two hundred and ten thousand kronen, it follows that the associations could be granted only very small loans or bounties, while for greater demands for money they must deal with the ordinary moneyed institutions. The loans granted by the department serve only as a supplement to the capital required for the enterprise. The department, however, undertakes to assist the associations in their dealings with the moneyed institutions. Its traveling agents, in addition to advising the department about loans to associations, advise banks as to the financial standing of the associations and thus aid them to secure loans from ordinary credit institutions.

Forty-three associations have been loaned money for the purpose of purchasing raw material. Not much has been spent in this way, as it has been difficult for the handicraftsmen, for personal reasons, to give up old sources of purchase, and because the conduct of common warehouses demands special knowledge and personal ability. The experience of the department, however, shows that these difficulties are not insurmountable and that such organizations for the purchase of materials are extremely helpful.

Loans have been made to associations organized for the purpose of conducting common warehouses for the sale of their products. The conduct of such enterprises requires even more capital than the raw-material warehouse and still greater business ability. At present there are comparatively few such selling associations, but some show good results.

Since the year 1898, loans have been made to 114 associations, amounting to 729,900 kronen. Of this, up to now, 58,100 kronen have been written off. This has been the result, for the most part, of the dissolution of associations. On this the department has lost eight per cent of the entire sum loaned. The associations pay three per cent interest on loans.

The department has done much to stimulate the better training of apprentices. For this purpose it has promoted exhibitions of the work of apprentices. The department prepared a guide and later a treatise on the subject of exhibitions of apprentice work, which are furnished to all persons interested in the subject. The department has assisted in the organization of such exhibitions by advice as to the best ways of preparation, by lectures on their ends and aims, by free supplies of printing, by money, and in other ways. In the year 1908 there were not fewer than six hundred such exhibitions in the Empire, in which about forty thousand apprentices took part. Besides these six hundred local exhibitions, there were in the same year over forty central exhibitions, with prizes, open only to those who had won prizes in the local exhibitions. The contributions of the department were, as a rule, four hundred kronen to the central and two hundred kronen to the local exhibitions.

The last catalog shows three hundred and forty-nine associations in Austria and Bohemia — forty-three in Vienna, seven in Prague, six in Brünn, six in Kratz, four in Innsbruck, and smaller numbers in smaller cities of the empire. Taking them by districts, we have ninety-two in Bohemia; twenty-three in the Tyrol; thirty-five in Stein-

mark; fifty-two in Mähren; eighteen in Silesia; twelve in Upper Austria; fifty-seven in Lower Austria; twenty in Galicia; and the remainder in other provinces of Austria. The distribution is over nearly all parts of the empire, although the industries in some localities appear to have been too primitive to be stimulated in this way. In more favored localities we find seventeen associations that are to-day exporting their products to other lands. The record of the grants to these associations shows that in thirteen cases the officials of the community in which the associations carried on business took over the property of the associations and conducted the business for the benefit of the community as a whole.

The Department for the Promotion of Handicrafts knows no cure-all for satisfying the needs of the handicraftsmen. Its methods of promotion possess at least the merit of containing no impossible demands on human nature and human resources. They are not pure theory, but have grown out of the immediate observation of economic life and have been applied by specialists who stand close to industrial practice. The different means of advancing the crafts are organically bound together and their picture in historical series shows exactly the development.

The department seems to have succeeded in its efforts to increase the number of industries that are large enough to permit of the use of modern machinery and modern methods of production. By a combination of education and co-operation the smaller industries have been able to make use of modern machine tools and motors, and thus make some headway against the capitalistic competition which threatened to overwhelm them. The future work of the Department for the Promotion of Handicrafts promises to be even more fruitful than the past. Plans are now under consideration that will furnish it in the future even greater opportunities for influencing the industries.

## CHAPTER XV

# COMMERCIAL SCHOOLS

THE special training of the mercantile classes of Germany is cared for in two ways: first, by organizing technical commercial courses in connection with some general educational institution, such as the "Realschule"; second, by organizing independent commercial schools.

Commercial education in Bavaria is generally provided in the commercial departments of the "Realschulen." These departments are organic parts of the school. The work of all the classes in the school from I to IV is the same. In class V three hours of drawing are dropped by the commercial pupils and replaced by three hours of theory of commerce and commercial arithmetic and one hour of drawing. In class VI four hours of drawing, two hours of descriptive geometry, and one hour of arithmetic are dropped, and replaced by four hours of theory of commerce and commercial arithmetic and one hour of penmanship. The commercial instruction is quite largely theoretical and lays but little stress upon counting-room work.

The pupils of the commercial department take part in the final examinations of the school, but are permitted to substitute a problem connected with the science of commerce for a problem in descriptive geometry. Students who pass the final examination are granted the certificate for one year's voluntary military service, the same as the other students of the school. They are also eligible to entrance into higher commercial schools.

Commercial technical departments are to be found in the "Realgymnasia" or "Ober-realschulen" of Aachen, Altona, Flensburg and Mainz. The work is of a somewhat more difficult character than that of the Bavarian schools mentioned above.

There are a number of independent commercial schools in Germany which devote considerable attention to general cultural subjects as well as to commercial instruction. Schools of this kind are to be found in Berlin, Cologne, Osnabrück, Munich, and Nuremberg. They are, as a rule, composed of six classes and have in general the same course of study as the commercial departments of the Realschulen mentioned above. The general cultural subjects are treated from the standpoint of their application to the work of the merchant. The passing of the final examination of these schools gives to the students the coveted certificate for one year's voluntary military service.

There is a much more numerous class of commercial technical schools in Germany where less or perhaps no general cultural instruction is attempted. These are either commercial continuation schools which give practical commercial work to young people already in commercial occupations for a few hours a week in addition to their work, or they are commercial technical schools which require the students to devote their entire time to school. It is very common to find both systems of instruction combined in one institution. There are many advantages in this arrangement, as the full-time school is usually better supplied with material, apparatus, and teachers than the independent commercial continuation school.

The organization, courses of study, aim, conditions of admission, and time of training in these schools are different in different places. Some are conducted by the State; some by communities; many by commercial corporations or by associations of other sorts; and a large number by private persons for gain. Elementary school training usually satisfies the requirement for admission, but there are schools of secondary rank requiring as a condition for admission the possession of the certificate for one year's voluntary military service. Such institutions are usually called "higher commercial schools."

The course of instruction varies from one to three years, with from four to twelve hours of instruction in the com-

mercial continuation school, and from twenty to forty hours of instruction in the full-time commercial school. The subjects of instruction are usually: Penmanship, business correspondence, bookkeeping, commercial arithmetic, theory of commerce and exchange, commercial geography, knowledge of wares, stenography, typewriting, foreign languages.

The great commercial associations of Germany play a very prominent part in the organization and maintenance of commercial education. A majority of the special commercial schools in Germany are supported and managed by these organizations, usually assisted and supervised by the city and State governments. These commercial associations and chambers of commerce are supporting schools, training teachers, building school buildings, and organizing systems of commercial education to fit young men and women for their needs. Up to the present time the State has given these schools less attention and support than it has given to the industrial schools.

In 1895, the business men of Germany founded an organization for the following express purposes: 1. To awaken and to promote an interest in and understanding of the importance of systematic commercial education for persons engaged in commerce and for those in authority; 2. To provide by means of periodical communications, as well as by conferences, for the regular exchange of experiences between institutions belonging to the Association; 3. By erecting a central office to provide a rallying point for their common efforts, where those engaged in the movement could obtain counsel and advice; 4. To work for the production of suitable textbooks and other school material; 5. To provide a special institution for the training of teachers of commercial subjects. This Association holds annual conferences and publishes a journal of commercial education. The membership of the Association includes a large number of the prominent commercial men of Germany. In 1899 there belonged to this Association thirteen prominent State officials, seventy-nine cham-

bers of commerce, forty-six city corporations, one hundred and eleven commercial associations, one hundred and fifteen commercial schools, and one hundred and twenty-four firms and private individuals. The Association still continues to increase in interest and importance.

Long before this Association was organized, however, isolated bodies of business men had attempted commercial training for the young merchant. The partial success of one or two of their attempts paved the way for the present organization. The commercial organizations of several cities of Germany have from time to time attempted to provide schools or instruction for commercial apprentices. The first really successful school of this sort in Germany owes its existence to the action of the business men of Leipzic, who founded a commercial school in 1831 known as the Commercial Institute.

In 1831, the date of the founding of this school, the merchants as well as craftsmen were still organized into guilds. Whoever engaged in commerce found it advisable to join one or the other of these guilds. These guilds tried to secure thorough business training for their apprentices and helpers, to encourage upright and honest dealings in commerce, to guard against infringement of the rights of members in the circles of industry, to prevent the bankruptcy of members engaged in commerce, and when bankruptcy really occurred to provide assistance for the unfortunate members and their families through the support of the property of the guild. Class feeling, in a good sense, as it suited the citizen-life of the middle ages, expressed itself in the guild organization. A sharp limiting of the rights and duties of all appeared to be the best way to make possible a peaceful living together of the different members of society.

There were two general mercantile guilds in Leipsic, the Guild of Retail Merchants and the Corporation of Wholesale Merchants. There were a number of commercial men outside of these two organizations who were permitted to have apprentices, but their supervision of these boys was

left to the guilds. The Retail Merchants' Guild was the oldest of these corporations, dating back to the fifteenth century. A considerable number of the wholesalers belonged to it, as through their membership they secured many advantages to their business. The conduct of the business of the guilds was entrusted to a board of nine shop-masters, chosen for life, of whom three were entrusted with the conduct of the money matters of the organization. The affairs of the wholesale dealers were also looked after by a board of nine, chosen for life. For any business which concerned the common welfare, it was not unusual for the two boards to act as one corporation. These two corporations were the founders of the Commercial Institute of Leipsic.

It was a part of the business of the guild officials to see that the members did not employ more apprentices than they could suitably train and supervise. The length of the apprenticeship was four years, at the end of which the young apprentice, if he had been industrious, received a certificate, showing that he was ready for promotion to the ranks of helpers or assistants. Then followed another period of four years for the assistant, at the end of which time, if his record was good, he received a certificate of good standing entitling him to carry on an independent business as a retail merchant.

These arrangements seem to have been meant to provide a thorough vocational training for the young merchant, but they did not work out well. The practical training was one-sided and incomplete, while the theoretical training was utterly inadequate. The training given in the elementary schools was not a satisfactory foundation for the practical business of the shop. During his early years in the shop the apprentice was employed in the simplest kinds of work. What he did learn was very seldom the sort of information that would enable him to carry on a business for himself. Very rarely did a systematic advance of the apprentice from the simple to the more important part of the business take place. The shop-keeper was more inclined to employ

his apprentice on the same piece of work as long as possible in order to avoid the trouble of the constant instruction of an inexperienced boy. The apprentice was employed mainly in the warehouse, which afforded few opportunities for instruction in the business, so that the opportunity to acquire more theoretical knowledge was lacking. This is a description given of the situation eighty years ago, and might be made to-day of many institutions where apprentices are employed.

The old guilds continued to take the principal part in the management of the school down to the time of the new industrial law of October 15, 1861. This law, which provided for the formation of Chambers of Commerce and Industry, greatly weakened the importance of the mercantile corporations. The corporation of wholesale merchants was changed into a commercial association in 1866 and dissolved in 1869. Its property, amounting to about 30,000 thalers, was transferred to the Chamber of Commerce. In place of its deputies, three members of the Chamber of Commerce took part in the management of the school. The Retail Merchants' Guild, after a long discussion, dissolved at the end of 1887. The Chamber of Commerce took over its property of about 850,000 marks with an agreement to develop the Commercial Institute further, and to fulfill the other obligations of the Guild. A new building was erected at an expense of 700,000 marks, and the salaries and pensions of the teachers were organized on a more satisfactory basis. In 1897, the present Director, Dr. Herman Raydt, took charge of the school. In addition to his duties as Director of the Commercial Institute, he now holds the position of Studien Director of the Handelshochschule in Leipsic, the first College of Commerce established in Germany.

The Public Commercial Institute is now governed by a board of six members, selected by the Chamber of Commerce of Leipsic, and the Director of the school. The aim of the school is: First, to give the commercial apprentices of Leipsic an opportunity, during the time of their apprenticeship, to acquire the general and special training demanded

by their vocation; second, to give to young men, who intend to devote themselves later to commerce or related industry, the general and scientific preparation needed. The Institute is divided, accordingly, into two principal divisions:

A. The Apprentices' Division, and

B. The Scholars' Division.

The Apprentices' Division (A) is organized into two parts:

1. The ordinary three years' apprentice division, which constitutes the general continuation school for apprentices of the commercial houses of Leipsic, attendance at which frees the pupil from the obligation to attend the city continuation schools, and

2. The one year's special course for apprentices, to which only those apprentices are admitted who have secured the certificate for one year's voluntary military service, or, in case they are foreigners, can prove a corresponding degree of education.

The Scholars' Division (B) consists likewise of two divisions:

1. The higher division, which gives full-day instruction for three years, and whose leaving certificate entitles the owner to the certificate for one year's voluntary military service, and

2. The one year's scholars' special course, which is to enable young men who already possess the certificate for one year's voluntary military service to prepare for the mercantile profession. In case they are foreigners they must prove a corresponding degree of education.

### A. Apprentices' Divisions

1. Only apprentices of Leipsic mercantile houses, who can pass an entrance examination, are admitted into the three years' apprentice division. These boys must have finished their fourteenth year and have the amount of education given by an elementary school. The written examination in the German language and in mathematics must show

at least the equivalent of the first (upper) class of such a school. The instruction is twelve hours a week for three years, distributed as follows:

| Subjects of Instruction | 3d class | 2d class | 1st class |
|---|---|---|---|
| 1. German language | 2 | 1 | 1 |
| 2. English language | 0 | 2 | 2 |
| 3. French language | 2 | 2 | 2 |
| 4. Commercial arithmetic | 4 | 3 | 2 |
| 5. Commercial science | 0 | 1 | 1 |
| 6. Counting-room work | 0 | 1 | 1 |
| 7. Bookkeeping | 0 | 0 | 2 |
| 8. Commercial geography | 1 | 1 | 0 |
| 9. Penmanship | 1 | 0 | 0 |
| 10. Stenography | 2 | 1 | 1 |
| Total | 12 | 12 | 12 |

Apprentices who are sons of former members of the Retail Merchants' Guild pay seventy-five marks per year; others, one hundred marks. All pay a matriculation fee of three marks.

As has been stated, only apprentices of Leipsic commercial houses who possess the certificate for one year's voluntary military service can be admitted into the special apprentice course of one year, which is as follows:

| | Hours per Week |
|---|---|
| 1. German correspondence and counting-room work | 1 |
| 2. English correspondence | 2 |
| 3. French correspondence | 2 |
| 4. Commercial arithmetic | 2 |
| 5. Commercial science | 1 |
| 6. Bookkeeping | 2 |
| 7. Commercial law | 1 |
| 8. Economic geography | 1 |
| Total | 12 |

The tuition fee is the same as for the other apprentices.

## B. The Scholars' Division

1. This division is composed of three classes, each with one year's instruction. Pupils admitted to the lowest classes must have finished their fourteenth year. On admission, the pupil must bring evidence of the date of birth, together with certificates showing the training he has had and his conduct. He must also pass an examination to show whether he possesses the education given in an elementary school.

| Subjects of Instruction | 3d cl. | 2d cl. | 1st cl. |
|---|---|---|---|
| 1. German language | 5 | 4 | 5 |
| 2. English language and correspondence | 5 | 4 | 5 |
| 3. French language and correspondence | 5 | 4 | 5 |
| 4. Mathematics | 3 | 3 | 3 |
| 5. Commercial arithmetic | 4 | 3 | 2 |
| 6. Physics | 2 | 2 | 0 |
| 7. Chemistry | 0 | 2 | 2 |
| 8. Technology and Warenkunde (study of commercial wares) | 0 | 0 | 2 |
| 9. General and commercial geography | 2 | 2 | 2 |
| 10. General and commercial history | 2 | 2 | 2 |
| 11. Commercial theory and commercial law | 0 | 2 | 1 |
| 12. Counting-room work, correspondence, and bookkeeping | 0 | 3 | 3 |
| 13. Political economy | 0 | 0 | 2 |
| 14. Penmanship | 2 | 1 | 0 |
| 15. Gymnastics | 2 | 2 | 2 |
| 16. Stenography | 2 | 1 | 1 |
| Total | 34 | 35 | 37 |

### Electives

| | |
|---|---|
| 1. Spanish | 2 |
| 2. Italian | 2 |
| 3. Russian | 2 |

The tuition fee is 500 marks a year for foreigners, in all classes, for people living in the German Empire 240 marks

in the third, 300 marks in the second, and 360 marks in the first class. For sons of members of the former Retail Merchants' Guild the tuition fee is 25 per cent less. The matriculation fee is ten marks for all.

2. Only young men who possess the certificate for one year's voluntary military service will be admitted to the special one year's course. This course seeks to prepare young men, by the scientific study of the principal branches of commercial life for positions in the counting-room, wholesale establishment, factory, or bank. Foreigners can be admitted on proof of an equivalent preparation. The course of study is as follows:

| Subjects of Instruction | Hours per Week |
|---|---|
| 1. English language and commercial correspondence | 5 |
| 2. French language and commercial correspondence | 5 |
| 3. Commercial arithmetic | 4 |
| 4. Commercial law | 2 |
| 5. Bookkeeping | 4 |
| 6. German correspondence | 2 |
| 7. Economics | 2 |
| 8. Commercial theory | 1 |
| 9. Commercial history and commercial geography | 3 |
| 10. Warenkunde (study of commercial wares) | 3 |
| 11. Penmanship | 1 |
| Total | 32 |

ELECTIVES

| | | |
|---|---|---|
| 1. | German for Foreigners | 2 hours |
| 2. | Italian | 2 hours |
| 3. | Spanish | 3 hours |
| 4. | Russian | 3 hours |
| 5. | Stenography | 2 hours |

The tuition fee for Leipsic students is 300 marks per year; for foreign students, 500 marks; for sons of members of the shop-keepers' guild, 225 marks. The matriculation fee is ten marks for all.

The school employs a Director, twenty-six principal

teachers, one special teacher, and three assistant teachers. The number of pupils in 1909 was 957, of whom 703 were in the three years' apprentice division, 57 in the special one year's apprentice course, 153 in the scholars' division, and 44 in the one year's scholars' special course.

Out of the 199 pupils in these two scholars' divisions: 71 were from Leipsic, 67 from other parts of the German Empire, 2 from Bulgaria, 1 from Denmark, 4 from England, 2 from France, 1 from Guatemala, 4 from Holland, 6 from Russia, 1 from Servia, 2 from South America, 2 from Sumatra. Between the years 1878–1879 and 1896 and 1897, inclusive, 2,328 pupils went through the three years' scholars' course. Of these 482 were from Leipsic, 866 from other parts of the German Empire, 178 from Austro-Hungary, 118 from England, 28 from France, 8 from Spain, 4 from Portugal, 38 from Italy, 21 from Switzerland, 13 from Belgium, 98 from Holland, 1 from Denmark, 45 from Norway, 9 from Sweden, 221 from Russia, 108 from Rumania, 4 from Servia, 1 from Bulgaria, 8 from Turkey, 5 from Greece, 19 from the United States, 33 from South America, 5 from the West Indies, 14 from Asia, 1 from Australia. These figures are interesting as showing something of the reputation of the school in the past and present. During the same period of time the school trained 6,911 apprentices of the commercial houses of Leipsic.

The teachers are selected by the Board of Control, and their salaries correspond closely with the salaries given to teachers in the Gymnasia and Realschulen. Arrangements have been perfected for pensioning old teachers of this institution. The qualifications of the teachers can be shown best by a copy of the information-sheet filed in the bureau of the school, concerning one of the last four teachers employed.

"Edward Weber, teacher of Arithmetic, Commercial Science, German, and Stenography, was born on the 11th of February, 1884, in Brunswick. After studying at a middle 'Bürgerschule,' he worked from 1898 to 1899 in the lottery and bank business; then served his three years' commercial

apprenticeship in a cigar factory and wholesale house, studying at the same time in the commercial continuation classes of the commercial school of Brunswick. At Easter, 1903, assisted by the German endowment for the preparation of young merchants, and by the authorities of his home, he began his academic preparation in Leipsic. He completed his course in the Commercial Institute in 1904, and entered the College of Commerce of Leipsic. In 1906, he passed the diploma examination for merchants and a special test in english commercial correspondence. From Easter, 1906, to 1908, he was a commercial teacher in the Higher Commercial Institution for Girls and in the Commercial Continuation School of the Chamber of Commerce of Brunswick. In 1908, he passed again the teacher's examination for the Commercial High school. Since this time, he has been an instructor in the Commercial School of the Chamber of Commerce at Hagen, Westphalia."

These statements give one an idea of the qualifications of teachers in this school. They must have general education, practical experience, and special training as teachers.

The school possesses a magnificent collection of articles of commerce, 6,265 pieces, all contributed to the school by various commercial bodies or by persons interested in its welfare. It is under the care of the special teacher of Commercial Wares, and is carefully classified into thirteen different divisions, with something like forty groups of objects. In the divisions you will find foodstuffs, luxuries, fats and oils, drugs (in a wide sense), useful plants from the tropics, technically manufactured animal and vegetable materials, fertilizers, materials used in the textile industry, paper and graphic art, tanning materials, coloring materials, products of mining and chemical industry, glass of different kinds. There are also special collections of wares from the German colonies, composed of 1,623 articles. (These are the figures for 1903.) The use of this collection makes easier and more interesting the subjects of Warenkunde, technology, the history of commerce and commercial geography.

Warenkunde, one of the two or three most important

special studies in a commercial school, concerns itself with the important commercial wares. In it is taught the nature, the historical and geographical origin, the preparation, the constituent parts, the chemical and physical peculiarities of wares, the evidence of goodness and genuineness, the ordinary adulterations, the means of detecting the same, and the packing and preservation of wares. It is based upon and closely connected with the natural sciences. Technology is concerned with the production of useful articles by man. A scientific treatment of Warenkunde and technology is possible only when the pupil possesses a certain amount of knowledge of the natural sciences and has access to a commercial museum. The collection also lends itself to the use of the teachers of other subjects, such as commercial geography.

Of course, it is impossible, as well as unnecessary, to study systematically and thoroughly all or any great number of the subjects found in a commercial museum. Some the student is actually to handle, and some he is to observe in a merely casual way. Articles which are handled by the merchants in their natural state, such as coffee, tea, and other raw materials, need not be systematically studied, as the young merchant will have plenty of opportunities to inspect them in the shop. It is entirely different with wares which in their preparation for the market have undergone a thoroug going change in material or form, or both, so that it is impossible to determine how they have been produced and out of what materials. The ordinary young merchant has a very insufficient knowledge of the methods of producing such articles. It is the province of the instruction in Warenkunde in a commercial school to equip the pupil with this knowledge. The chemistry, physics, and Warenkunde are therefore studied in the closest union in a commercial school. Some microscopic work is done in connection with this study. Tests are made, as for instance with textiles and other raw materials. Investigations which require comprehensive apparatus and a great

degree of chemical knowledge and practice must be left to the commercial schools of higher grade.

In technology an attempt is made to enable the pupil to see the production of a ware from the raw stuff through all the stages of its development into a finished product. You can see this attempted in the collection in the museum with many articles of commerce. In connection with technology excursions are made to different manufactories where the pupil is given an opportunity actually to see many useful objects produced. During the year 1909, the Professor of Warenkunde in the Commerce Institute and his class visited nine industrial plants, the Manufactory of Machinery in Leipsic, the Cocoa and Chocolate Factory in Leipsic, the Royal Procelain Factory at Meissen, the Chemical Factory in Leipsic, the Glass Work Factory in Corbietha, the Bibliographical Institution in Leipsic, the Sugar Factory in Schwichz, the Factory for Worsted Yarn in Greitz, the Wool-Weaving Mill in Greitz, and the Dye Works and Finishing Institution in Greitz.

Bookkeeping, which divides the honors with Warenkunde as one of the central points of the special commercial instruction, is taught here very thoroughly, sensibly, and with a view to definite mental and moral results. I cannot do better than to quote Director Raydt's statement of the end and aim of this instruction: "Goethe, who was perhaps the wisest and greatest man of all time, called double-entry bookkeeping one of the most beautiful discoveries of the human mind. It is also one of the best means for the education of the pupil. Through an unbroken course of business of weeks and months the pupil must carry on his work with the greatest diligence and the most minute accuracy if he hopes to secure correct results. A single bit of carelessness places the success of the whole work in question. Instruction in bookkeeping leads, therefore, to earnest reflection and care, and, what is more important, the pupil himself experiences how fatally a single error brings its own punishment. At the end the facts

must agree, and the worker must often seek for a long time before he discovers his own mistake. This training leads to a careful foresight, which is so difficult for the youth and is still so necessary for the man. Finally when all the different books taken together agree to a penny, what a satisfaction does the pupil feel over his work! His self-consciousness is heightened and a joy of creation comes over him, not known before. His purpose to do something correctly is strengthened and his sense of economy, accuracy, and order is developed. Out of such simple elements are formed the character of man, and bookkeeping instruction has contributed an element to character-building that the young men of our time especially need. 'To know is good; still, to be able *to do* is better.' Here the pupil sees that he has done something.

"And then what cultural elements lie in the instruction in bookkeeping and the closely united instruction in correspondence and counting-room work! 'Dry, horrible things,' say the laymen. The men who see nothing but the dry figures see little. The one, for instance, who sees in a bale of Guatemala coffee, which is to be booked and about which so many letters are to be written back and forth, only a sum of money, overlooks a source of ideas which flow in the inspiring instruction of a capable teacher. Sometimes such a teacher will let the thought of the pupils wander, perhaps to Hamburg, to the counting-room of the great merchant who meditates as to whether he will risk the prevailing course of the markets and set in motion, with a flying word, a great ship with captain, pilot, and sailors to bring the valuable cargo through the storms of ocean safely to the home harbor.

"Before the fancy of the pupil will display itself long trains of mules bringing the heavy sacks over the coast mountains to the sea. Before his eyes arise plantations, among the primeval forests, where sun-browned men and women cherish and protect the delicate plants until the wonderful harvest. The busy clang of the machines which shell, clean, and sort the fruit rings in their ears; in short,

a wealth of pictures unite themselves in this bale of coffee, whose burnt beans, brought to her door by the small shopkeeper, the mother grinds in a lonely hut in the Erzgebirge mountains, smiling with pleasure in anticipation of the brown, refreshing drink. The union into a harmonious whole of the pictures bound up with the sack of coffee gives the spirit of the pupil a salutary satisfaction, and he recognizes gradually that a man can get satisfaction out of life in proportion to the educational elements he can make his own." This picture may seem fanciful, but no one can become a great merchant without imaginative power, without the ability to think in pictures as well as in figures.

The cultural value of the instruction in commercial theory, commercial law, and economics is exceedingly great, and is usually either overlooked or treated as something for the university only. In these subjects are treated the fundamental ideas of commerce, its division, persons, objects, usages, commercial associations, character and meaning of exchange in mercantile intercourse, the German laws of exchange, banking, credit papers, question of money, credit, and instruments of exchange, and the most important questions of the commercial politics and revenue of a people. A skilful teacher has here, step by step, opportunities to make clear the great importance in our economic life of the mercantile calling. If he can compel the pupils to earnest reflection over the commercial phenomena of the present time, very much will be gained for their spiritual education. The teacher can show the pupils that all these dry facts of economical, political, and legal life are penetrated by great moral ideas, if they can be made to recognize as the most important of commercial morals, only the one truth—that a business is only right when all parties, buyers and sellers, gain advantages thereby. There will come in the course of the instruction, first unconsciously, perhaps, the conviction that honor, right, truth, and faith form the immovable foundation of commercial intercourse; that not chance, but honesty, diligence, and perseverance lead to lasting results.

Time will not permit me to follow up the analysis of the other subjects of instruction. I have selected those peculiar to the programs of commercial schools. That they are practical and also possess cultural value will be admitted by all who have followed the work of the Commercial Institute. I believe that the work in this institution is carried on in a spirit of fairness, good sense, and devotion to lofty educational ideals that has enabled the school to give thorough special training without sacrificing general culture. This point is all-important.

It is admitted by all that good general education for the merchant of to-day is not only valuable but indispensable. It is generally admitted that if we begin the special education of the merchant or anyone else too soon, without a solid basis of training, we shall not raise the class, but leave it on a lower level. Men to-day are not only subjected to a severe professional competition, but they are forced into public life and into politics. They have duties not only to themselves and the corporations they serve, but to the community and the State. There is, too, a general feeling in Germany that the present development of commerce and industry demands a special training in their many-sided technique. The modern commercial school, therefore, must rest upon the union of general and special education. What is the "irreducible minimum" of general training required in such a scheme? It will be hard to answer this question to anyone's satisfaction. Some would demand so much general training that special training would be impossible. I have attempted to give Leipsic's answer.

It will be observed from this outline that commercial schools in Europe are, too, to some extent, technical schools. It is also true that every lower technical school teaches commercial subjects. In other words, a man trained for commerce is trained to know not merely reckoning, bookkeeping, and stenography, but must have some general scientific training and a knowledge of the theory of commerce that includes more than buying in the cheapest places and selling in the dearest. He must study technology, and

must know his wares, and be prepared to guide, in some degree, the purchaser in his choice of means for gratifying his wants. On the other hand, the technically trained man needs to know something about the laws of trade and commerce. He needs to know commercial reckoning and bookkeeping. He must be a business man as well as a technician. Every good commercial school, then, must lay great stress upon science, including physics, chemistry, biology, geography, technology, and Warenkunde,—the study of articles of commerce, their historical and technical development from raw material to finished product. This study must be carried on in laboratories and museums of commercial articles and be supplemented by visits to factories and business plants. With the higher technical and artistic training of the producer must come the corresponding technical and artistic training on the part of the business man who sells the product.

## CHAPTER XVI

# INDUSTRIAL SCHOOLS FOR GIRLS

UP to the middle of the nineteenth century little or no attempt was made to provide technical school training for girls. As a rule, only the daughters of the poor were under the necessity of supporting themselves. As these were employed in domestic service, or as washwomen, seamstresses, saleswomen, or factory workers, there seemed to be no need of special schools for them. The so-called industrial schools of the time were charitable institutions rather than schools for technical instruction. The children received training in handwork of various sorts, with a little instruction in the subjects taught in the elementary school.

The higher and middle classes of Germany finally began to feel the need of securing economic independence for their daughters. Many of these women remained unmarried, and almost the only means of self-support open to them was work as teacher or governess. This field was overcrowded and wider opportunities were necessary if girls were to enter into vocational life prepared to support themselves properly.

In the sixties commercial schools for girls began to arise in the great cities of Germany. In 1865, the Central Association for the Welfare of the Working Classes published a memorial, urging the opening of new sources of industry for women. This memorial led to lively discussion, and finally to the founding of the famous "Lette-Verein" of Berlin. This Association set before itself the following objects:

1. The removal of obstacles and prejudices in the way of the employment of women.
2. The fostering of industrial institutions for the commercial and industrial education of women.

3. The furnishing of information regarding opportunities for learning trades and securing situations and help, in so far as existing institutions were inadequate.

4. The establishment of women's exchanges for the exhibition and sale of women's handwork and other artistic products.

5. The protection of working women against harm, moral and otherwise, especially by giving them information regarding suitable lodging houses and by organizing credit societies to enable them to secure sewing-machines.

The institution of the "Lette-Verein" is a large one, with over three thousand students. It includes a commercial school for girls, with a two years' course, and a so-called "industrial school," with courses in handicrafts, machine sewing, tailoring, history of costumes, dressmaking, millinery, hairdressing, embroidery (both hand and machine), industrial design and composition, washing and ironing, lacemaking, cooking, diet for the sick, sewing, preserving of fruits and vegetables, ordinary housework, and simple bookkeeping. There are also divisions for kindergarten work, training teachers for industrial schools, training servants for houses, tailoring, bookbinding, and photography. An employment bureau is maintained to assist women in securing positions.

The same year, 1865, in Leipsic, the German Association of Women organized a similar school, and began a steady campaign for the better education of the female sex and for the freeing of industrial work for women from the things that were fettering its development. They agitated through women's unions and the press for the founding of productive associations, the establishment of industrial exhibitions of the products of women's work, the founding of industrial schools for girls, the building of homes for girls, and, finally, for schools for the higher scientific training of women.

Many cities have taken up the work of women's education, and great progress has been made in the commercial, industrial, and art training of girls under the direction of

the public authorities. The private schools formed at this time were generally poorly organized, with incompetent teachers and insufficient equipment.

Somewhat different in character from the technical schools are the housekeeping schools, which are intended, as the name indicates, for girls from the working classes who have been compelled immediately on leaving the elementary school to enter into practical life in a business house or factory, and are thus left without opportunity, before marriage, to acquire the knowledge and skill needed for the systematic management of a household. Family life is destroyed in many cases on account of the wife's lack of skill in ordinary housekeeping. For this reason, during the past thirty years, great numbers of housekeeping or home-making schools have been established for women who are engaged in factory work, sometimes by public-spirited unions, sometimes by employers and owners of factories for their own women workers.

The conviction finally made its way into wider circles that this training in home-making is needed not only for the daughters of the poor, but for the daughters of well-to-do citizens. As a result, most of the higher schools for girls now include cooking and home-making in their courses of study. During the last twenty years it has become necessary to provide commercial and industrial training for girls of both the higher and the middle classes, and for this purpose industrial and commercial departments are combined with the housekeeping schools, or in some cases special industrial or commercial schools are provided for girls who have finished the elementary school.

The task, however, has long since become so difficult, so comprehensive, and so costly that the public organizations — State, province, and community — have been called upon for assistance. The State has granted increasing appropriations to women's schools established by the unions, and finally has itself undertaken to provide special schools, which shall include cooking and home-making courses, together with industrial and commercial training

for life outside of the home. Prussia has founded three State home-making, industrial, and commercial schools, in Posen, Rheydt, and Potsdam, and a fourth has been begun in Thorn. These schools also include a department for the training of teachers for the vocational courses in the elementary and the continuation schools for girls. They are intended to serve as model institutions for women's vocational training and are wholly supported by the State.

Most of the elementary schools in the towns of Germany provide instruction in home-making and women's trades in the latter years of the course. These courses are not always popular with the elementary teachers, but this opposition is diminishing. Many good school men, however, insist that this is not enough and that the elementary school cannot solve this particular problem, which is not a problem of educating children, but of educating adolescents. Dr. Otto Lyon, Director of the schools of Dresden, urges the importance of a continuation school for girls which shall be neither a continuation of nor a supplement to the elementary school instruction, but rather an independent institution with its own peculiar character.

Continuation schools for girls are not very numerous in Germany, but there is a decided tendency to increase them in number and efficiency. The leading school men, such as Kerschensteiner of Munich and Lyon of Dresden, and the leading women in the schools, for example, Helene Mentzel and Helene Lange, are insisting upon greater opportunities for women in the vocational schools. Great organizations of women throughout the Empire are agitating for industrial schools of all sorts and are supporting many by their own contributions. The movement is sure to succeed eventually, but the way the concessions are made, and the reasons therefor, may be interesting.

In the introduction to the report of an industrial school for girls in one of Germany's most famous cities you may see the following:

"Nature has created two kinds of beings and has united the perpetuation and development of the human race with

their lives and activities. This fact can not be denied. It must make itself manifest in the aim of education. It will be generally admitted, and the history of the ages confirms it, that marriage forms the foundation of civilized society, that the care and education of the new generation is at first the part of the mother, and that a well-ordered family forms the best foundation for a prosperous community and national life. It will also be admitted that a different problem has been assigned to the two sexes, and that this must be expressed in the aim of their education. One must consider the mother as the most important factor of family life, because her mother's love, given by nature, chains her to her child and causes her to be interested above all in its progress and well-being.

"It follows that the position of the wife and mother in the home can not be considered as one of inferior importance. Public and home life are two equally valuable factors in the life of a people and each part contributes in its way to the content of the life of a people; the home in the form of the natural personal intercourse, the public life in the relations established by forms of law.

"Different but equal opportunities must be provided for the two sexes. The various vocations open to women must be taught in schools, with the constant thought that each woman is a member of a family and will be the center of a new family. In vocational education it must be remembered that the boy is to be a citizen as well as a workman. In the education of girls it must be remembered that they are centers of family life as well as workers in industries."

The inference is that the boy must be taught civics and the girl housekeeping.

There seems to be a necessity for looking deeper. In the first place, there are 866,414 more women than men in Germany. Early marriage must be given up, as the modern home offers less opportunity for work or occupation than formerly. Better education leads the girl to other aims, and makes her less willing to be a household drudge than formerly. The German vocation census of 1907 shows a

great growth in women's work in the industries. The number of women who are in the industries has doubled in twenty-five years. In 1882 it was 4,200,000; in 1907, 8,200,000. Almost one-half of the grown-up women of the country are at work in the industries.

According to the Prussian vocation statistics of 1895, of the 1,259,000 girls between the ages of 14 and 17, there were 661,000, or 51.9 per cent, who were actually engaged in earning a livelihood. Of these, 218,000, or 17.2 per cent, were engaged in domestic service, and 443,000, or 34.7 per cent, in the industries. In 1901, there were in the 603 Prussian public and private schools for girls, including 339 commercial, trade, industrial, cooking, and household arts schools, and 204 sewing, embroidery, and weaving schools — all together—only 24,313 pupils, leaving in Prussia 638,687 girls without any continuation school instruction. These figures prove that only about three per cent of the girls now receive vocational instruction in the schools.

In an address delivered in June, 1911, before the Association of Industrial Teachers, held in Eisenach, Helene Mentzel, a teacher in the State School for Girls in Posen, presented the following picture of the situation in Germany:

"The girl of fourteen who leaves the elementary school is just beginning the period when the mind hungers after nourishment. Before she can learn her capabilities and gifts, she is compelled by circumstances to earn money. Without supervision, without a guiding hand, she goes from school into life with its dangers and temptations. She must undertake a battle for which she is not prepared. Much as one may appreciate the work of the elementary school, it cannot be denied that its influence ceases exactly at the time when character-building begins.

"Our physicians daily have the experience that the most careful nursing and supervision in the sick-room proves fruitless if the sick lack suitable care at home. One of the saddest phenomena of our times — the under-nourishment of our children — is to be traced back to the household incompetence of so many women. My own experience in

the care of the poor has taught me that this calamity, for the great part, is the fault of the woman. She has not been taught before marriage to handle time, money, and power. She lacks the sense of economy; she lacks the feeling of preserving things and of frugality. In her girlhood, which has passed between employment and enjoyment, she has never had to care for her own needs. The task now falls to her of looking after the greatest part of the family income. Here careful, systematic relations can be established only where the woman has learned to abandon unnecessary things in favor of the necessary. On the difficulty of housekeeping is shattered the happiness of many a workingman's family.

"It is still more to be deplored that the woman often undertakes the duties of a mother without a suspicion of the holiness and responsibility of the task. The statistics of the cases where the inexperience or carelessness of the mother has caused injuries and infirmities never to be cured would reach alarmingly high figures. A sound and happy race will grow up only when the full responsibility to the future race is appreciated by the maidens of all classes; when every woman regards it as her holiest task to found the happiness of her children upon the transmission of sound physical and mental gifts. The bodily and mental peculiarities of children can no longer be regarded as matters of indifference.

"Mothers undertake the same responsibility for the moral education of their children. 'The hand that rocks the cradle rules the world' — this holds true for all mothers. The comprehensive literature of children's psychology of the present day teaches the great importance of children's impressions in character-building. These impressions are as lasting in the thatched roof and in the cellar as in the hygienic and artistic rooms of the rich. 'As the green tree takes up every beam of sunshine; as the thirsty field sucks up every drop of rain, so stand the senses, the mind, and the heart of children — open to every influence.' The highest happiness of earth and its heaviest sorrows grow

out of the education given to children by their mother. To train the girls of the people to become efficient housekeepers and mothers, worthy of their task, is the common interest of the State and of the community."

Fräulein Mentzel urges that modern conditions also demand special training of women for the industries and for commerce. About 9,000,000 German women old enough to be so employed are in vocations of one sort or another. The number in the handicrafts and industries increased from 1,500,000 in 1895 to 2,100,000 in 1907. She deplores the fact that these women are going into the unskilled occupations. She states that only 5.8 per cent of the women are in skilled vocations, while 38 per cent of the men employed are employed in skilled vocations. The work of these women bears the stamp of cheapness and worthlessness. She urges that it is short-sighted social politics for Germany to assign its women to unskilled labor only; that the moral effect of such a situation is unwholesome and dangerous; that the low wages gained by unskilled women laborers leads to insufficient nourishment, unsanitary dwellings, and immoral practical results of every sort.

There is a movement now in progress to offer girls better opportunities for vocational instruction in the continuation schools. Dr. Otto Lyon of Dresden is one of the leaders in this movement,. In a monograph he has written on this subject he states:

"There are many in Germany who deny the necessity of such schools, and argue that no such institution existed in their youth and still they got along in the world. They forget the development in conditions brought about by modern economic life. Formerly, when both father and mother performed their work at home, when the conditions of life were simple, when food, shelter, and clothing were cheap, they were able to support and educate their children, and to equip them with the little practical training they needed for life. To-day things are vastly different. Both man and woman are economic factors. In many cases both must earn their livelihood outside of the home. House and

children are largely left to themselves, and if they do not perish, as happens in many cases, they suffer greatly.

"When the children leave school they take positions in the strange new world. Young girls of fourteen, while developing in mind and body, are obliged to leave home, are cut off from education at a time when they are highly capable of being trained and eager to learn, and are left without counsel, without the true guidance and direction of those who have their welfare at heart.

"Servant girls who enter a well-ordered household and are guided by an efficient woman fare the best, but most girls shun such a position because it offers so little freedom; they prefer the free life of the factory worker, or the saleswoman — positions in which they easily fall victims to temptations, immorality, and finally disease and misery. These positions outside of the home would be a source of happiness and a blessing to these girls if they were supplied with good food, and technical and ethical education, if they were advised in the time of their inexperience by a true, experienced teacher of a continuation school, who would watch over their pleasures and enjoyments and arrange for them evening entertainments, excursions, visits to the concert and theater, thus cultivating and purifying not only love of work and study but also pleasure and joy in life.

"If the young girl between fourteen and eighteen years of age is thus placed under mental and moral guidance and schooling, while at the same time she is thoroughly and specifically prepared for a vocation that will enable her to rise through her own strength to an independent existence. Not only her education, but her personality and her mental and bodily efficiency for life, are greatly augmented, and her social and economic position is placed on a more solid basis, and many a social evil of our age remedied. The continuation school for girls is not only a pedagogical, but also a social and economic ideal, the realization of which must be aimed at under all circumstances.

"The vocation which the girl has chosen or wants to

choose should be the center of the continuation school. The education must, however, be an all-round one. It must not keep in view only the technical side, but it must include the commercial and economic side. It must not emphasize the extent of knowledge, but the grade of efficiency. It must lead the growing girl into the consciousness that in her vocation she does not live for herself alone, but that everywhere she is a part of a larger whole and while she receives protection and benefit from this larger whole she also her has duties toward it. She must be acquainted with her relations to family, community, and State; she must learn that she is to be an example to others by conscientious, irreproachable conduct and by helpfully acting with the whole. The school should implant high ideals in her heart, make her emulate the character of great women, and convince her that aside from intelligence and above it, the will and the heart are the foundation of every vocation and the true masters of it.

"The girls must be prepared for the ideal side of their vocation by instruction in the German language and literature, studies which must hold up the models of true human greatness, and cultivate the love for nature and art in a simple but impressive manner. A practical and vocational side should also be given to German by means of exercises in business composition, letters, and descriptions of vocational work and products and of their manner of production. Some instruction should be given in civics, as to the economic conditions influencing the vocation. It should be made clear that every girl should prepare for a twofold vocation, the domestic and the industrial or commercial. Household arts must be studied by every girl in the continuation school. There must also be instruction in industrial branches; classes must be formed for dressmakers, clerks, milliners, designers, bookkeepers, etc. Every girl must learn a trade in order to enable her to lead an independent life. Along with the knowledge she must acquire the power to do which will enable her best to protect herself against misery and temptation."

Dr. Lyon and Dr. Kerschensteiner, as well as the leading women of Germany, urge compulsory industrial continuation schools for girls with day instruction grouped about their vocation. They insist that Germany cannot longer ignore this problem in the face of the present situation. Already a few German communities have established such industrial continuation schools, and girls are admitted to many of the courses in the art-trades, textile, and commercial schools. The ladies in the Royal family of Prussia are supporting industrial schools in Berlin and other places, and better opportunities for the vocational training of women are in sight. A further evidence of this change is the admission of women to many of the university courses and their increasing share in the work of teaching.

## CHAPTER XVII

# TRAINING OF VOCATIONAL TEACHERS IN GERMANY

THIS chapter was written for the Annual Report of the United States Bureau of Education, for 1910–11, and is reproduced here by permission of the Bureau.

In this article is described the training given to teachers of German vocational schools of middle and lower rank, including the continuation schools and the various special trade schools — the building and machine trades, the art-trades, the commercial schools, and vocational schools for women. No mention is made of the training of teachers for the highest class of vocational schools, as there is no proposal for the training of such teachers. These teachers are selected directly on the basis of scholarship and personality, qualities that are invaluable in all grades of teachers. When, however, schools and teachers become numerous, teachers must be employed who are not to the manner born; who are not necessarily distinguished by profound scholarship or strong personality, but who must be trained.

In the beginning of any movement for a new class of schools, trained teachers are lacking, and positions in such schools are quite commonly filled by persons with more enthusiasm than knowledge of the business, as well as by inefficient persons from other occupations who seek an asylum in the public school service. In Germany, as in other countries beginning to install vocational schools, the instructors have been largely part-time teachers from other schools or from industrial vocations, to whom the vocational teaching has been a side-issue. This is almost invariably the case in America, where our evening schools are taught either by elementary or secondary day school teachers or by persons struggling to gain professional standing in some other field.

In some cities, as in Chicago, would-be lawyers, doctors, etc., are no longer eligible to positions, but these positions are reserved for trained teachers. This, however, is only the first step. These professional teachers should also be technically trained in the vocations followed by their pupils and employed for full time in the continuation school work. Under no other condition can we secure the *esprit de corps* so necessary to the complete success of a system of schools.

In Germany great emphasis is laid, and in my opinion rightly, on what they call "corporate (or school) spirit"—the feeling that one's school is an independent and important organism, worth while for its own sake, and not merely an appendage to something else. Accordingly, there is now a general movement towards organizing vocational schools on an independent basis, with their own corps of teachers, their own special school buildings, and, finally, their own arrangements for training teachers for this new sort of work.

The standard for such teachers is constantly rising in Germany, and at the present time the teaching of vocational subjects there has been elevated to the dignity of a profession, demanding thorough preparation, general and special. The situation is different in different parts of Germany, the south German States being distinctly in advance of their northern neighbors. Everywhere, however, it will be found that people are discussing the question of securing better trained and more efficient teachers for the vocational schools.

## VOCATIONAL SCHOOLS IN PRUSSIA

The vocational schools, except the technical universities, in Prussia are under the management of the Ministry of Commerce and Industry. For a number of years the Prussian authorities have been struggling with the question of training vocational teachers for the continuation and middle schools. The measures they have taken, with the exception of those for training teachers for women's work, seem to me fragmentary and insufficient. They are interesting, however, to Americans who are just beginning to think about

the problem, and may furnish helpful suggestions as to first ways of meeting emergencies. The fundamental need in Prussia was to induce persons to accept teaching positions who were both theoretically schooled and familiar with the practical side of industrial life. In the first instance such persons were very rare, and it became necessary to make provision for training them. The government has endeavored to fix the standards for this preparation, as well as to provide for the internal management of training schools.

In 1885 only a few of the teachers in the vocational schools of Prussia could lay claim to a pension. Their average salary was very small, and their social position was inferior to that of teachers in other schools. The Prussian government has endeavored to change this, and to-day not only are the salaries of the principals and teachers of the schools wholly paid by the State, but the city vocational school teachers are appointed for life, with the right to pensions for themselves as well as for their widows and orphans. Those teachers of the State vocational schools who have a university education receive also a dwelling, or a cash compensation for rent. While the salaries are smaller than those paid in America, they approximate those given in the best academic institutions of Prussia. The Prussian government has also undertaken to award titles and official positions to teachers in vocational schools, especially to teachers of State institutions of this kind. The effect of these two regulations is to make it easier to induce a high class of persons to undertake the training necessary for successful service in the vocational schools.

The difficulty, however, in Prussia has been only partly overcome. The training of vocational teachers for girls' industrial schools seems to have advanced the most. The steady advance of the movement for the emancipation of women in Germany and the increasing difficulty of preparing them for self-support under modern social conditions have finally induced the Prussian government to make systematic arrangements for the training of women for work. In January, 1907, the Prussian government decreed that a normal

department should be established in connection with every school of domestic science subsidized by the State. The decree also prescribed the course of study in the department. A detailed account of this organization will be given later.

In the Prussian schools for the building trades and schools of mechanical engineering, no special arrangement for the preparation of teachers has been made so far. There is no institution in Germany for training such teachers, and, so far as I know, no system of examinations to test whether applicants have the requisite knowledge and skill. It seems to be quite the fashion to employ in such schools graduates of higher technical institutes who have seen successful service in the industries and have an interest in teaching. Very few of the ordinary academic teachers are to be found in these schools, even as teachers of the academic subjects. In the effort to keep in touch with modern industrial conditions, the school authorities have almost invariably selected practical men from the industries as teachers. As a further measure for securing this close relation with industrial life, many of these men have been encouraged to devote a part of their time to work in the industries. This is in striking contrast to the regulations of many school boards in America which penalize any teacher who endeavors to engage in practical work outside of the school room.

It must not be assumed that the Prussian authorities utterly neglect the matter of industrial training for this class of teachers. As has been stated, such teachers are required to have an advanced education obtained in the university or the technical school, and especially to have had adequate experience in industrial life. Further opportunities are given for the professional education of such teachers by means of visits to other cities, leaves of absence (with pay,) for further study, and permission to engage in private occupations along the general lines of their teaching activities. The younger teachers are also encouraged to employ their summer vacations in further special preparation.

The Prussian government is especially concerned about the training of teachers for the art-trades schools. Such

teachers must keep in touch with the progress of art; for example, by becoming familiar with new fields of activity in industrial design. Courses of instruction have been arranged for teachers in different fields of industrial art during the last few years. As for instance, by Architect Riermerschmidt in Munich, dealing with designs for furniture and interior architecture; courses in flat ornamentation at the Industrial Art and Trade School of Magdeburg; in lettering in the school of design in Düsseldorf under Professor Behrens; in mural painting and decorating for teachers in technical schools under the direction of Professor Mohrbutter in Charlottenburg; and finally a course in mural decoration under Professor Hammel in Hannover. Mention may also be made of courses in plant designs in 1901–02 and in 1909, conducted by Professor Meurer in Rome and Berlin, which were attended by fifty Prussian teachers and directors. Such teachers are assisted by grants given by the State or municipality for teachers' study journeys. Similar journeys are encouraged by grants to teachers of the textile branches.

## TRAINING FOR TEACHERS OF THE CONTINUATION SCHOOLS

The professional preparation of teachers for these schools is more urgent and more important than that for any other class. In earlier times, this continuation work was generally intrusted to teachers of elementary schools, who were seldom sufficiently prepared to give the proper instruction. It has been found necessary to give special training to all teachers employed in the continuation schools, and very thorough training to those employed to teach drawing and technology. When the whole continuation school system of Prussia was transferred to the Ministry of Commerce and Industry, twenty-five years ago, one of its first moves was to train teachers for these schools. During the years from 1886 to 1894 professional drawing courses were given in Berlin, Düsseldorf, and Hannover, where the sum of $2,284 was set aside annually. These were attended by 400 teachers.

In consequence of the steadily increasing number of continuation schools, the number of these courses was then increased, courses in commercial instruction, language, and arithmetic being added. In 1905 the sum appropriated for this purpose amounted to $80,940, and in 1909 to $47,600. The number of teachers employed in the continuation schools in 1904 was 11,517, of whom 549 were employed in day continuation schools, and, therefore, were compelled to sever their connection with the elementary schools. The number of such day continuation schools is rapidly increasing, and with it the necessity of making larger provision for the preparation of teachers for this work. The Prussian government is now feeling the necessity of preparing teachers in elementary schools who have a normal school training to begin with and need technical knowledge of a vocation, and also skilled workmen in a variety of industries who require professional school practice in handling classes and ability to teach according to pedagogical principles. The Prussian government is still struggling with the problem, but, so far as the writer can see, has not worked out a thorough system for meeting the demands of the present-day vocational school.

## TRAINING OF VOCATIONAL TEACHERS FOR GIRLS' SCHOOLS

As has been pointed out, this class of vocational schools is in better condition, so far as the training of teachers is concerned, than the other vocational schools of Prussia. Since 1907 the Government has endeavored to deal directly and adequately with the problem. Some detailed account of this may be of interest in this connection.

There are three groups of teachers for vocational work for women in Prussia:

1. Teachers of women's handwork (such as needlework, and crocheting).
2. Teachers of household arts.
3. Teachers in schools for women's handicrafts.

Careful provision is made for training teachers for each of these classes. The first group of teachers are prepared to teach children in elementary, middle, and higher schools to do some handwork, such as knitting, crocheting, sewing, and embroidery. The teachers of the second group give instruction in school kitchens of the elementary schools where cooking and other ordinary housework is taught. In the third group the teacher is prepared to teach older girls in the special continuation schools to do more difficult work, such as tailoring, dressmaking, and millinery. It has been usual, but not universal, for teachers in this group to qualify first as teachers of women's handwork and household arts, and then build upon this for the more advanced work.

At first, vocational teachers were trained in private schools. Since 1890, the State has founded three state schools for girls, one at Posen, one at Rheydt, and one at Potsdam. One of the main purposes of these State schools is the preparation of women teachers of vocational work. These teachers are required to have a thorough training in several special subjects, based upon the general education given in a fully developed higher girls' school or girls' middle school of Prussia, or proof of an equivalent. After this comes the mastery of the technique of women's handwork in special vocational schools. The course of study for these teachers of women's handwork is a good preparation for the training of teachers in schools for women's handicrafts. Such teachers, in the future, must put in a year in women's handwork and household arts as a preliminary, in order that they may not be inferior in their technical knowledge and skill to the ordinary teacher of these branches.

The decree for the training of teachers of the third group, issued in January, 1907, provides that industrial teachers must not only attend an institution for the training of such teachers, but must also serve at least a half year in actual industrial life and a probationary year as teachers before receiving a certificate to teach. The knowledge provided by the theoretical training is not considered sufficient.

This must be supplemented by practical application of the theory in the industries themselves, which no school training can replace. Finally, the training in methods of instruction can be successfully carried on only when a candidate both is trained in theory and has had experience in the industry itself. To sum up, the entire training consists of three stages: theoretical instruction in the training school; practical experience in the industry; and probationary teaching.

The Government permits the experience in the industries to be gained either before or after attendance at the training school. On the contrary, the probationary year must follow the instruction in the school, and, in no case, can the probationary year be used for ordinary teaching; it must be reserved for the training of the young teacher. For this reason, only a small number of probationary students are sent to any one school.

Several different kinds of certificates are given to teachers, depending upon the specialty they select. As has been stated, a teacher of the third group is qualified to teach a class in handwork or in household arts. A teacher of millinery must be able to give instruction in other vocational subjects. In order to accustom themselves to the various types and sizes of schools, every teacher must be able to handle more than one vocational subject.

The Ministry exercises great care in the admission to the training school of candidates from middle schools. Only schools of equal grade with the higher grade schools are accepted.

The policy of basing the training of teachers in schools for women's handicrafts upon the training of teachers of handwork and household arts has given rise to many questions. There is some doubt as to whether such candidates should be required to pass the examination required of teachers of handwork and of household arts before entering upon the advanced courses. It seemed to many that the time taken in preparation for such examinations could be better employed for further training. On the other hand, all the girls who would pass the first examination

would not pass the second one, and would be required to give up study before the completion of their training. If they had passed the first examination, all would not be lost, as they could teach handicrafts and household arts in the elementary or higher girls' school. The interests of the girls, themselves, then seemed to demand that they be required to take the first examination before entering upon the advanced courses.

Admission into the seminary (or training school) for teachers of the third group requires not only the passing of an examination as teacher of household arts and women's handwork, but also that preparation be made in a women's educational institute, approved by the Ministry of Commerce and Industry. The school conducted by the Lette-Verein is permitted to prepare teachers for everything except drawing. The Pestalozzi-Froebel House trains teachers for cooking and household arts. The Victoria School in Berlin trains teachers for dressmaking and millinery.

The three state institutions at Posen, Rheydt, and Potsdam all undertake the training of teachers for women's vocational work. Each of these three schools has four divisions: a school of household arts; a school of handicrafts; a commercial school; and a seminary for training teachers. Everyone is urged to take the course in household arts, in which is taught an outline of all that an experienced housekeeper must know. The students receive instruction in cleaning and other household tasks, cooking, baking, sewing, mending, science of nourishment, care of children, and care of the sick. Special optional courses are given, such as courses for continuation school work and simple handwork, dressmaking, sewing, millinery, drawing and painting, cooking, baking, washing and ironing. It is also proposed to add a training course in kindergarten work.

The hour plan for the various teachers' courses in these State schools follows:

## TRAINING OF TEACHERS OF HANDWORK

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Handwork | 9 | 12 | 420 |
| Machine sewing, cutting and preparing linen articles of clothing | 8 | 6 | 280 |
| Study of materials | 1 | 1 | 40 |
| Drawing | 4 | 2 | 120 |
| Pedagogy | 2 | 1 | 60 |
| Practice teaching and method | 2 | 5 | 140 |
| Hygiene | 1 | 1 | 40 |
| German and civics | 2 | 2 | 80 |
| Arithmetic | 1 | .. | 20 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF TEACHERS OF HOUSEHOLD ARTS

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Cooking | 10 | 10 | 400 |
| Handwork | 3 | .. | 180 |
| Housework, including washing and ironing | 6 | 3 | 60 |
| Natural science, including instruction about food | 3 | 3 | 120 |
| Domestic economy, keeping of household accounts | .. | 1 | 20 |
| Pedagogy | 2 | 1 | 60 |
| Practice teaching and method | .. | 7 | 140 |
| Hygiene | 1 | 1 | 40 |
| German and civics | 2 | 2 | 80 |
| Arithmetic | 1 | .. | 20 |
| Drawing | 2 | 2 | 80 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF INDUSTRIAL TEACHERS OF COOKING AND HOUSEHOLD ARTS

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Cooking | 12 | 12 | 480 |
| Housework | 6 | .. | 120 |
| Washing and ironing | .. | 6 | 120 |
| Machine sewing | 3 | .. | 60 |
| Natural science, including foods | 2 | 2 | 80 |
| Keeping of household accounts | 1 | 1 | 40 |
| Pedagogy | 2 | 2 | 80 |
| Practice teaching | 1 | 5 | 120 |
| Civics and political economy | 1 | .. | 20 |
| Drawing | 2 | 2 | 80 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF INDUSTRIAL TEACHERS OF HANDICRAFTS AS WELL AS MACHINE SEWING

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | Weekly Number of Hours 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Handicrafts and machine embroidery | 14 | 12 | 520 |
| Machine sewing | 5 | 5 | 200 |
| Science of machine sewing | 1 | .. | 20 |
| Study of materials | 1 | 1 | 40 |
| Study of style | 1 | 1 | 40 |
| Technical drawing | 4 | 4 | 160 |
| Pedagogy | 2 | 2 | 80 |
| Practice teaching | 1 | 5 | 120 |
| Civics and political economy | 1 | .. | 20 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF INDUSTRIAL TEACHERS OF DRESSMAKING

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | Weekly Number of Hours 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Making dresses | 21 | 19 | 800 |
| Art of machine sewing | 1 | .. | 20 |
| Study of materials | 1 | 1 | 40 |
| Technical drawing | 3 | 3 | 120 |
| Pedagogy | 2 | 2 | 80 |
| Practice teaching | 1 | 5 | 120 |
| Civics and political economy | 1 | .. | 20 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF INDUSTRIAL TEACHERS OF TAILORING

| Subjects of Instruction | Weekly Number of Hours 1st Half Year | Weekly Number of Hours 2nd Half Year | Total Number of Hours |
|---|---|---|---|
| Tailoring | 19 | 17 | 720 |
| Art of machine sewing | 1 | .. | 20 |
| Study of materials | 1 | 1 | 40 |
| Technical drawing | 4 | 4 | 160 |
| Art of making suits | 1 | 1 | 40 |
| Pedagogy | 2 | 2 | 80 |
| Practice teaching | 1 | 5 | 120 |
| Civics and political economy | 1 | .. | 20 |
| Total | 30 | 30 | 1200 |
| Singing and turning | 4 | 4 | |

## TRAINING OF INDUSTRIAL TEACHERS OF MILLINERY

| Subjects of Instruction | Weekly Number of Hours | Total Number of Hours |
|---|---|---|
| Millinery | 18 | 360 |
| Study of materials | 2 | 40 |
| Drawing | 8 | 160 |
| Study of costumes | 2 | 40 |
| Total | 30 | 600 |

TRAINING OF INDUSTRIAL TEACHERS OF THE ART-TRADES

| Subjects of Instruction | Weekly Number of Hours Half-Year Terms 1 | 2 | 3 | 4 | Total Number of Hours |
|---|---|---|---|---|---|
| Artistic handwork | 14 | 16 | 14 | 10 | 1080 |
| Art of machine sewing | 1 | .. | .. | .. | 20 |
| Study of materials | 1 | 1 | .. | .. | 40 |
| History of the textile arts | .. | .. | 2 | 2 | 80 |
| Study of style | 1 | 1 | 1 | 1 | 80 |
| Drawing | 12 | 12 | 10 | 10 | 880 |
| Pedagogy | .. | .. | 2 | 2 | 80 |
| Practice teaching | .. | .. | 1 | 5 | 120 |
| Civics and political economy | 1 | .. | .. | .. | 20 |
| Total | 30 | 30 | 30 | 30 | 2400 |
| Singing and turning | 4 | 4 | 4 | 4 | |

The Prussian plan of preparing vocational teachers is followed in most parts of Germany, academic teachers and men trained for the industries being employed in varying proportions, with more or less special preparation for their vocational teaching. Nothing, however, that can be called a system exists in Prussia, or anywhere else in Germany outside of Munich, Wurttemberg, and Baden. Classes may be found suffering from instruction by a teacher who does not know the industries he attempts to teach, and others becoming demoralized under a mechanic who cannot teach or govern.

## THE MUNICH PLAN

At the annual conference of the Association of Teachers in Technical Institutions of Great Britain held in Southport, 1911, Thomas J. Burnett, Master of Method for the Edinburgh school board, discussed the question of training of teachers for the continuation schools. In his address he gave a translation of a communication he had received from Dr. Georg Kersehensteiner, Director of Education of Munich. In this communication Dr. Kerschensteiner says:

"The training of trade teachers in Germany is carried on, properly speaking, in only two towns—in Karlsruhe and Munich. In the rest of Germany trade teachers are mainly

chosen from the certified students of the different technical day schools. Vienna has an excellent school for trade teachers in its technological industrial museum.

"In regard to Munich in particular, the town in which trade teachers are more generally employed in continuation schools than in all Germany and Austria, we train our trade teachers ourselves. Every year, when need arises, we issue a notice that first-class men engaged in trade are wanted for the different branches of woodwork and metalwork. As soon as applications have been received, we decide whether the candidates are to be admitted to the examination. The examination includes the execution of a piece of practical work, the drawing of the plans of that work, an estimate of the expense entailed, and a written description of the steps involved. If the examination is passed, the candidates must next practice for six months, without pay, in the workshops for instruction provided for that purpose. In the second half-year he must continue his practice, but receives a wage of $0.75 per day. In the meantime he has also to complete his training by attending a course of lectures on the theory of education, on technology, on tool-and-machine construction. After the course of a year he has another examination to pass, which includes the same things as the first examination, and in addition the lectures heard in the course of the year. Besides, he has to stand a test of his teaching powers before a class of pupils. If this examination is passed, he is appointed trade teacher at a salary of about $535.00. It may be added that excellent candidates come from the metal and woodworking industries.

"As trade teachers for other different trades we choose direct from the workshop men who can show very good testimonials, and we watch whether they are successful in teaching. At first they get but a few lessons to teach at so much per lesson; if they approve themselves they get more and more, and if they do very well, are then finally placed in a responsible position. This policy has throughout proved successful."

## WÜRTTEMBERG PLAN

In Württemberg and Baden the governments have grappled with the problem and have evolved a method of training vocational teachers that can claim to be systematic and thorough. The following is a description of the organization of the Württemberg system.

Württemberg has had vocational schools of high, middle, and lower rank for many years. The lower schools were entirely reorganized by the law of July, 1906, which provides for:

1. Placing the entire organization of such schools on a vocational basis.
2. Special support of these schools independent of the general system.
3. Compulsory attendance between the ages of fourteen and eighteen.
4. Time and duration of instruction given to apprentices.
5. Training of teachers and inspection of these schools.
6. Obligation of employers with reference to these schools.
7. Discipline and regular attendance.
8. An industrial school council to manage these schools.

The law is comprehensive and is well worth the study of Americans interested in the subject. Mr. Albert A. Snowden has written a full description of the industrial schools of Württemberg, which is published in the Teachers' College Record of Columbia University.

In the vocational schools the vocation dominates not only the course of study, but also the entire organization and administration, including the special training of the teachers. The law prescribes three successive years of instruction to apprentices in continuation schools between the ages of fourteen and eighteen, paralleling the years of apprenticeship. Within these limits the school is to be organized in the way that seems best adapted to secure training for the vocation.

The vocational school works under difficulties comparatively greater than those of the elementary school. The pupils of the elementary school are all prepared in the same general way, and advance through successive grades without a break. In the vocational school the material is not all trained in the same way nor to the same degree, many of the pupils having left the elementary school after finishing the fifth, sixth, or seventh grade, and eighty per cent of them without completing the entire eight grades. The vocational school must, therefore, build upon a somewhat narrow basis of experience, must deepen and widen this experience, and bring about a way of looking at things that will go beyond immediate observation, and aim at the understanding of both the "how" and "why" of the practice in the vocation. The teacher is compelled to give up the ordinary notion of progress through the various subjects, and must constantly repeat his instruction in the essentials with an ever wider application to the experience gained in vocational life. In other words, he must employ what used to be called in America "the spiral method."

In the vocational school, correlation of subjects is especially important. The subjects of instruction must grow out of each other. Industrial work and a certain amount of commercial work must be taken together. Technical instruction must be given in the closest connection with everything else in the course. All the work of the school is related to the vocation and tested by its usefulness in the vocation. In most cases this close correlation among all the things given in the school can be best secured by having teachers each of whom can teach all the compulsory subjects of the general division to which he is assigned. Four divisions are recognized in the Württemberg plan: the machine-trades division; the building-trades division; the art-trades division; and the commercial division. Every teacher must be prepared to teach all the subjects included in one of these divisions. Such an arrangement is inevitable in all but the largest places, but in any event is best suited to the securing of the correlation of subjects

necessary in a vocational school. The organization for the large places only might be different, but there are advantages in having all of the vocational schools organized on one general plan. The vocational teacher must, therefore, possess a wide and extended training in technology, commerce, the art-trades, and pedagogy. Such teachers, engaged all the time in their own divisions, can do more to build up an *esprit de corps* than any number of teachers of special subjects.

The effort to secure teachers by the ordinary methods of advertising and examination has failed. Teachers must be trained for this special task. Now the two classes of persons who can be trained are the experienced academic teacher and the trained technical man from the industries. Of these two, the academic teacher lacks technical and business knowledge and must be trained technically and commercially; the technical man has technical knowledge, but must gain power of control and skill in presentation. Every well-organized school should have representatives of both classes. Only those who have mastered one of the vocational groups technically, commercially, and pedagogically are permitted to teach in a vocational school in Württemberg.

As has been stated, the work of the vocational schools can be divided into four groups: (1) the machine-trades group; (2) the building-trades group; (3) the art-trades group; (4) the commercial group. The Württemberg plan provides for the training of technical teachers thoroughly equipped in some one of the four main groups and in the rudiments of business theory and methods of instruction. The employment of teachers whose technical knowledge is limited to one of these groups, or a part of it, would be possible only in the largest schools, and their employment even there would be bad for the school system.

In small places, where perhaps only a single teacher is employed, that one should be thoroughly trained in the leading industry of the locality; and he must know in addition the rudiments of other trades or vocations if he

is to perform his function fully. In larger places some division of labor among the teachers is possible. In Feunbach, a suburb of Stuttgart, with about thirteen thousand inhabitants, the writer visited a vocational day school with two divisions, one for the building-trades group and one for the machine-trades group. One of the teachers was trained in the building-trades school at Karlsruhe and one in the machine-trades courses at Stuttgart, described later in this article. In still larger places, I found the division of labor among the teachers carried much further. In one instance, I found one teacher caring for a division consisting of printers' apprentices only. In each case the division of labor did not extend within the main group of subjects, but one teacher was required to care for his entire division. and often was promoted with it at the end of the year, Part-time teachers were employed usually to teach the optional subjects only, full-time teachers caring for the compulsory ones. Such teachers of optional subjects are not included in the general scheme for training teachers, but take short special courses of from two to six weeks' duration.

The full-time vocational teachers of Württemberg are trained in extended courses carried on in special schools for training teachers of this class of work. The teachers who specialize in the building trades are now sent to Karlsruhe, in Baden, the best school for vocational teachers in Germany. Here they take a course of three and one-half years. The students in this course are drawn from the class of experienced and efficient elementary and secondary teachers, who have already had the pedagogical training of the teachers' training school. They have been through at least six years of a secondary school before going to the training school, so that they are well grounded in ordinary cultural subjects. Württemberg grants them an allowance of $240.00 per year while they are at Karlsruhe. After finishing the course there, they are required to spend from six months to a year in actual shop practice in the industries. The course in Karlsruhe will be described in connec-

tion with the discussion of the training of vocational teachers in Baden. In 1907, there were some forty or fifty candidates from Württemberg in the Karlsruhe training school.

The teachers for the commercial continuation schools are sent to commercial colleges, where special courses for training such teachers are provided. Leipsic, Manheim, Cologne, Berlin, and other cities have such courses, the one at Leipsic being especially good for this purpose. Besides this, preparatory courses of one and one-half years' duration were established in Stuttgart in 1907. Candidates for such courses are selected from elementary and secondary teachers of exceptional ability.

Similar provisions are made for candidates for positions in the art-trades group. Such candidates are usually sent for their training to an art-trades school such as the ones at Stuttgart and Munich.

The selection of so many elementary teachers for these courses is, for the most part, based on reasons of expediency. Skilled technical and business men are equally desirable, but harder to get. In fact, most thinkers regard them as better material for teachers of vocations. It is, however, difficult to attract efficient architects and engineers to the teaching profession, while it is dangerous, as we know in America, to employ men from the industries who have been misfits in their profession and who often seek an asylum in the industrial school service. Württemberg is, however, finding it necessary to train some men from the industries for its service, and has organized special courses for the purpose The course is one and one-fourth years in duration. Candidates must have had the training of an industrial school of middle or higher rank and successful experience in their profession, but for this course they receive no scholarship allowance, as many are likely to fail to meet the demands of the new profession. The course is mainly pedagogical for one year, with a review for the examination for the remaining three months.

On account of the demand for vocational teachers, it has been urged that such practical men be allowed to teach

their own specialties without much preparatory training, at least in the larger cities, where it would be possible to find places for men who can teach only one subject. This proposition was rejected for several reasons. It would prevent the formation of an institutional interest and pride in the vocational school — a general interest in training boys rather than in teaching subjects. It would destroy *esprit de corps* in the teaching force by filling the most important positions (those in the larger cities) with teachers of the least special preparation, and thus lead to indifference on the part of better-trained teachers whose opportunity for advancement would be cut off. Merit would cease to rule, and lack of training would bring special privileges. Württemberg preferred to wait, and frowned upon all attempts to organize industrial schools before properly trained teachers could be provided. The law of 1906 was, therefore, to be put into operation in 1909, after teachers had been trained, special buildings erected, and a complete organization perfected.

This is not the American system, where in our haste to reach the end we are apt to overlook the means necessary for success.

The demands made upon students at the Karlsruhe training school have been adopted for the training course for the technical men in Stuttgart. The man's specialty is reviewed and he receives some training in the rudiments of other trades. He is given some training in business subjects, as his pupils are likely later to become independent business men. His main training, however, is pedagogical; this is thorough and comprehensive, extending over a full year, and including both the theory and the practice of teaching.

Mastery of the subject-matter is not a sufficient preparation for teaching it. Highly trained technical men often fail when put before a class. While the Württemberg school takes all possible care to make sure that the teacher knows his subject, it also insists upon a training in theory and in the practice of class-room work. The teacher must be

taught how to use his material, how to sift out essentials and treat them in a systematic way, and how to handle a class, secure attention, and preserve discipline.

The lecture method is not employed in these courses, except in a very few subjects, the seminar method being the favorite one. Observation of good teaching in vocational schools is one of the features, and students make excursions to the best industrial schools of Baden to observe the work done there. Characteristic problems are worked out in the seminar and students are encouraged to attack similar problems themselves. The seminar attempts careful treatment of the subjects of the "question" and the "explanation."

The instruction is not, however, limited to mere matters of detail, but goes into the general theory of education, with a historical survey of its development and of its leading representatives. Special divisions of the general subject are given thorough treatment. The technical man is shown the interworking of social science and pedagogy and the necessity of a knowledge of methods of instruction. He is made to feel the responsibility of the teacher and encouraged to make a wider research into the educational questions of the time.

The course for such technical men is shown by the program given below:

1. The course is one and a quarter years in length, of which one year is devoted to the study of pedagogical questions and three months to a review before the service examination. Those who pass the examination are immediately assigned to temporary work in the schools.

2. The number of students in each course is twenty. This allows for the dropping out of some before the end of the course.

There was at first some disposition to lighten these requirements, in view of the great demand for vocational teachers. The authorities, keeping in mind the importance of the function these teachers performed, decided not to place the minimum too low. The vocational teachers must

form a contingent of the public service equal in rank to the general body of officials, if these schools are not to lose the confidence of the people. This is important, in view of the prominent position accorded to the German teacher. The vocational teacher must be the equal of the academic teacher in culture, salary, and professional ability if the vocational schools are to sustain themselves.

High demands as to general culture are made upon the vocational teacher. These men teach business and cultural subjects as well as technology. Such teachers must possess the general training indicated by the completion of the first six classes in a secondary school.

Along technical lines these technical men must possess a technical training equivalent to that of the architect who has obtained the State master-builder's certificate, or, in the case of the mechanical engineer, to that of one who has passed the diploma examination. In the case of an art-trades teacher, he must show the qualifications necessary for the drawing teacher's examination. Technical men who wish to become vocational teachers and who have passed none of these examinations must prove their technical qualifications by a preliminary examination.

The course requires thirty-six hours per week. At Karlsruhe students spend an average of forty-five hours a week and commercial students twenty-eight hours a week. More can be exacted of the technical men than of the commercial students, because a large part of the time in the former courses is employed in drawing and in practice work, which do not require so much outside preparation.

The subjects of instruction are as follows:

| Subjects of Instruction | Hours per Week | |
|---|---|---|
| | 1st Semester | 2nd Semester |
| 1. Industrial arithmetic and calculations of cost | 1 | 1 |
| 2. Business correspondence and business calculations | 1 | 1 |
| 3. Geometry and plane trigonometry | 2 | .. |
| 4. Physics (with mechanics and electricity) | 2 | 2 |
| 5. Chemistry and theory of materials | 2 | 2 |
| 6. Technology (teaching of working tools, machinery, and technique of work)— a few especially important industries | 1 | 1 |

| | | |
|---|---|---|
| 7. Bookkeeping and theory of exchange | 2 | 2 |
| 8. Theory of political economy | 1 | 1 |
| 9. Legal principles | 2 | .. |
| 10. Introduction to industrial school practice | 2 | 2 |
| 11. Pedagogy | 1 | 1 |
| 12. Technical special instruction: | | |
| A. Freehand drawing | 2 | 2 |
| B. Theory of projection, theory of light and shade, perspective | 2 | 2 |
| C. Technical drawing and modeling: | | |
| (*a*) For the machine technical-trades: | | |
| Instrument-makers | | |
| Machine-makers | 3 | .. |
| Pattern-makers, wagoners, and smiths | 2 | .. |
| (*b*) For the architectural callings: | | |
| Masons | 4 | .. |
| Stone-cutters | 4 | .. |
| Carpenters | 4 | .. |
| Glaziers and joiners | .. | 4 |
| Locksmiths, plumbers and installers | .. | 3 |
| (*c*) For the art-trades: | | |
| Sculptors | .. | 4 |
| Painters | .. | 4 |
| Harness-makers and decorators | .. | 2 |
| Total | 38 | 34 |
| Practice teaching | .. | 4 |
| | | 38 |

The above course is planned for mechanical engineers who are preparing to become vocational teachers. For this reason, a comparatively short time is given to technical instruction in engineering, as it would offer nothing new for the candidate. If men from the building trades or art trades enter these courses, the number of hours in 12 C *b* or *c* can be reduced in favor of more work in the mechanical engineering subjects. If the technical man is especially qualified in one division, he can give special attention to some other in his vocational course.

The management and supervision of the course is in the hands of the Royal Industrial Council. Teaching halls are opened in localities requiring a course of this sort. Such halls are well-lighted and provided with the necessary equipment, and with drawing-rooms and laboratories. As instruction in technique and drawing demands the use of material which is found only in special technical institutions, courses will be offered in the Royal Building-Trades School

of Stuttgart, and the teachers of this institution will be available to conduct them.

As already stated it has not seemed wise to make State grants to technical men carrying on studies to prepare for work as teachers in vocational schools. The situation is not the same as with the teachers studying in Karlsruhe. The Karlsruhe candidates are already in the State teaching service, and are on a leave of absence for advanced work. The State support is only a partial compensation for their loss of salary. These teachers have already proven their qualifications in work for the State, and it is reasonably sure that they will be successful in their new school work at Karlsruhe. They have already demonstrated their ability in the class-room. With the technical man the case is different. He is required to change his calling, and enter into a profession, not knowing whether he will "make good" or not. No one can guarantee that a State scholarship awarded to such persons will be a good investment. It seems, therefore, not to be wise to encourage such men to enter the profession by a money scholarship, except in the special case of unusually capable men who have already demonstrated their ability in the class-room of a continuation school.

## TRAINING OF VOCATIONAL TEACHERS IN BADEN

The Grand Duchy of Baden was one of the earliest European states to take up the systematic training of its youth for a vocation. Their vocational schools are well organized and the teachers are exceptionally well trained for their work. Baden has had, since 1882, a well organized school in the city of Karlsruhe for the training of vocational teachers. For this reason, a full statement of the requirements for such teachers in the Grand Duchy of Baden, together with a transcript of the program of work carried on in the school for the training of vocational teachers, may be of interest and value. I shall omit unimportant details.

### TRAINING OF COMMERCIAL TEACHERS

The Ordinance of 1907 with reference to the training and examination of commercial teachers provides as follows:

An appointment as a commercial teacher depends upon the passing of an examination which is given every year by a committee of the National Industrial Commission. Admission to the examination depends upon proof of—

1. Citizenship of Baden.
2. Acceptance as a candidate for the position of teacher in the elementary schools or the completion of the seventh year of a secondary school.
3. A certain amount of experience in mercantile business, as given below.
4. At least two years' attendance at an educational institution designated by the Ministry of the Interior for the training of commercial teachers.

Elementary school teachers must furnish evidence of practical service in a mercantile business of at least one year, and candidates who have finished the seventh year of a secondary school must put in two years in such service, all of which service must be completed before attendance at the school for training commercial teachers.

The examination is divided into a written and an oral part. It covers the following subjects:

1. German composition.
2. German business correspondence.
3. Commercial mathematics.
4. Bookkeeping.
5. Foreign languages.
6. Stenography.
7. Typewriting.
8. General economic geography.
9. Political economy and science of finance.
10. Legal principles.
11. History of commerce.
12. Lectures on teaching and theory of method.

The requirements in these twelve subjects are as follows:

1. German composition: Written treatment of some subject lying within the circle of observation of the candidate.

2. German business correspondence: The ordinary commercial correspondence and counting-room work.

3. Commercial mathematics: Ordinary business arithmetic; equations of the first and second degree with one or more unknown quantities; logarithms; arithmetical and geometrical series; calculations of compound interest and stocks; theory of combinations; binomial theorem; calculations of loans and insurance.

4. Bookkeeping: The most common system of bookkeeping for banks and manufacturing establishments, with accuracy in preparing final statements.

5. Foreign languages: English or French (according to choice of candidate). Knowledge of grammar, phonetic training, facility in oral use, oral translation into German of letters and essays written in foreign languages, and written preparation of a translation of German matter relating to commercial affairs into the foreign language.

6. Stenography: Mastery of the system of Gabelsburger or Stolze-Schrey; writing of at least one hundred and fifty syllables per minute.

7. Speedy writing on a typewriting machine.

8. General economic geography: Thorough economic geography of Germany with reference to the most important branches of industry; the ways and means of commerce; production, peculiarities, and uses of the most important articles of commerce.

9. Political economy and science of finance:

(*a*) Fundamental conceptions of political economy with special attention to money, coinage, banks, markets, and joint stock affairs; commerce and trade politics, the labor question, insurance, the historical development of special economical movements or tendencies.

(*b*) Science of finance in relation to tariff and taxes; community and State finances.

10. Legal principles: Commercial law, laws of exchange, and maritime law, as well as the provisions of the civil code most important for the merchant; civil processes and trade regulations; patent rights; trade-marks; bankruptcy law;

outline of constitutional, administrative, and international law.

11. History of commerce: Outline of the history of commerce in ancient times and in the middle ages, with a thorough study of the history of commerce in modern times, especially since 1900.

12. Courses on teaching and theory of method: Skill and ability in handling a given problem in school instruction; knowledge of the course of study of commercial schools and the treatment of the special subjects of instruction. Every candidate is permitted to undertake an examination in one or more modern languages (English, French, Spanish, or Italian, in addition to the one already chosen by him). This further examination may be taken after the candidate passes the examination as a commercial teacher.

A candidate who fails may repeat the examination after the expiration of a year; if he does not pass at the second trial he will not be permitted to try again.

The fee for the examination amounts to twenty marks, and for the further examination on special languages five marks. Upon request the fee of persons without means may be wholly or partly remitted.

The ordinance contains an emergency clause to the effect that so long as Baden does not have a sufficient number of teachers at its disposal measuring up to these requirements, persons may be employed as commercial teachers who have gained the necessary knowledge in other ways, and have proven their fitness by instruction in a commercial school.

### TRAINING OF INDUSTRIAL TEACHERS

The ordinance concerning the preparation and examination of teachers in industrial schools is as follows:

Applicants for appointment as teachers in industrial schools must pass a special examination. This is divided into a preliminary examination and a principal examination. The examination is held every year under the direction of a committee of the National Industrial Commission. Ad-

mission to the preliminary examination depends upon proof of:

1. Citizenship of Baden.

2. Acceptance as a candidate for the position of teacher in the elementary school or the completion of the seventh year of a secondary school.

3. Attendance in the first three classes in the industrial teachers' division of the Building-Trades School of Karlsruhe.

To be admitted to the principal examination, candidates must have passed the preliminary examination, must have attended from the fourth to the seventh class in the industrial teachers' division of the Building-Trades School in Karlsruhe, and must bring proof of the prescribed practical experience in industrial life. This practical experience must amount, in the case of elementary teachers, to at least one year, and, in case of candidates who have finished the seventh class of a middle school, to at least two years. It must be finished before the candidate enters upon the fourth class in the industrial teachers' division of the Building-Trades School in Karlsruhe. The time spent in industrial operations or in vacation work for the Building-Trades School will not be reckoned in this practical experience. A more detailed account of the nature of the practical work will be given later.

The examination is divided into an oral and a written part. In the preliminary examination there is also a test of the teaching ability of the candidate.

A. The preliminary examination covers the following subjects:

1. German composition.
2. Mathematics.
3. Descriptive geometry.
4. Physics.
5. Chemistry.
6. Elements of mechanics.
7. Freehand drawing and painting.

B. The principal examination includes the following:

I. For the building-trades department:
1. Theory and design of building construction in stone, wood, and iron.
2. Elements of the theory of mechanics.

II. For the machine-trades department:
1. Theory of mechanics.
2. Elements of electro-technology.
3. Elements of the theory of building construction.

III. For both architectural and machine-trades department:
1. Grammar of form, and elements of the history and technique of industrial art.
2. Science of materials and mechanical technology.
3. Applied drawing and painting.
4. Modeling.
5. Political economy and legal principles.
6. Bookkeeping and calculation of cost.
7. Courses on teaching and theory of method.

### Requirements for the Examinations

The following are the requirements in the individual subjects of examination:

### A. For the Preliminary Examination

1. German composition: Written treatment of a theme within the circle of observation of the candidate.

2. Mathematics: General arithmetic; industrial and business calculations; equations of the first and second degree with one or more unknown quantities; logarithms; arithmetical and geometrical series; calculations of compound interest and stocks; theory of combinations; binomial theorem; elementary theory of maxima and minima; plane geometry; solid geometry; plane trigonometry; selected chapters from the elements of analytical plane geometry.

3. Descriptive geometry: Straight lines and planes in space; curved and warped surfaces; penetration of curved surfaces by planes (conic sections); penetration of opposite curved surfaces; tangents and tangent surfaces; determination of the true size of projected surfaces and plane figures;

development of curved surfaces; development of irregular surfaces; application of descriptive geometry to important practical examples; theory of light and shade; perspective.

4. Physics: Knowledge of physical phenomena and laws, with simple proofs, especially of the theory of light, heat, magnetism, and electricity; knowledge of physical apparatus, and practice in the use of apparatus commonly employed in school instruction.

5. Chemistry: Knowledge of the fundamental conceptions of chemistry, and of the appearance and peculiarities of the most important elements and their combinations in the fields of organic and inorganic chemistry so far as they are of special importance for the industries; the most important points in chemical technoolgy; practice in experimentation.

6. Elements of mechanics: Theory of specific gravity and of the movements of solid, liquid, and gaseous bodies; the simple machines; graphic statics; strength of materials; application to simple construction in the fields of architecture and engineering.

7. Freehand drawing and painting: Skill in the technique of the different kinds of drawing and painting: sketches of simple natural objects; elements of grammar of form.

### B. For the Principal Examination

#### *I. For the Architectural Department*

1. Theory and design of building construction in stone, wood, and iron:

(*a*) Knowledge of brickwork: Brickwork bonds, plans for chimneys, slating or shingling, openings in walls (windows, doors, and the like), construction of arches, plans for toilet-rooms, steps in stone, wood, and iron, wood-joints, position of beams, partition walls, truss-work and strut-frames; roof construction.

(*b*) Knowledge of inner architecture, especially of the work of the cabinet-maker, glazier, and locksmith.

(*c*) Knowledge of simple construction in iron, e. g., of columns and ceilings.

(*d*) Working out of problems and sketches pertaining to parts of buildings of stone, wood, and iron.

2. Elements of the theory of machinery:

(*a*) Description of the elements of machines and of simple kinds of machines.

(*b*) Reproduction of parts of a machine in sketches and upon this basis a complete drawing of the same.

(*c*) Treatment of simple problems in the field of engineering.

### *II. In the Technical Engineering Department*

1. Theory of mechanics: Calculations and construction of the elementary machines, including the crank, transmission, pump, lifting apparatus, steam boiler, steam engine, and hydraulic motor; knowledge of gas motors and of machine tools; calculation of gearing, velocity, etc.

2. Elements of electro-technology: General principles; calculation of simple transmission for house installation; the best known applications of the electrical current; knowledge of simple electrical machines for direct currents and their methods of operation.

3. Elements of architecture:

(*a*) Knowledge of simple building construction.

(*b*) Treatment of simple problems in the field of architecture in stone, wood, and iron.

### *III. For Both Architectural and Mechanical Departments*

1. Geometry and elements of the history of artistic handwork and of the technique of the art-trades:

Sketches of stone, wood, and metal forms.

Historical survey of the development of industrial art and of the most essential technique.

2. Theory of materials and mechanical technology: The most important materials met in the industries, their peculiarities, uses, and treatment. The most important tools and machine tools.

3. Applied drawing and painting: Sketches of simple decorative forms, with and without application of color.

*IV. Modeling*

Modeling of simple ornaments according to a given drawing.

*V. Political Economy and Legal Principles*

The most important points in political economy with special regard to the industrial needs and the existing organization of the industries and the social institutions of Baden; the constitution of the Empire and of Baden; the state and community governments; the most important provisions of the civil code and of the laws of commerce and exchange; organization of justice and judicial procedure; the most important trade regulations, especially the organization of handicrafts and the protection of workingmen; workingmen's insurance; nature of associations; the building ordinances of Baden; the elements of the tax legislation of the Empire and of the Grand Duchy of Baden.

*VI. Bookkeeping and Calculations of Cost*

Elements of double-entry bookkeeping, of calculations of cost, and of the theory of accounts current.

*VII. Courses on Teaching and Theory of Method*

How to treat a given problem in school instruction; knowledge of the course of study in the industrial schools; discussion of special subjects of instruction.

PRACTICAL INDUSTRIAL WORK

The authorities of Baden lay down explicit rules concerning the nature and extent of the practical industrial work to be done before entrance into the fourth class of the department of industrial teachers in the Building-Trades School of Karlsruhe.

A. Persons who intend to devote themselves to the calling of an industrial teacher and who have been accepted

as candidates for the elementary schools must take the following course of work in the industry:

| | | |
|---|---|---|
| Masonry work | 2 | months |
| Carpentry work | 1 | " |
| Building and artistic iron work | 1 | " |
| Work of joiners and furniture-makers | 1½ | " |
| Tinsmiths' work | 1½ | " |
| Whitewashers' and decorators' work | 1½ | " |
| Mechanical engineering work | 1½ | " |
| Optional work | 2 | " |
| Total | 12 | months |

B. For those who enter from the seventh class of a middle school the work is as follows:

| | | |
|---|---|---|
| Masonry work | 4 | months |
| Carpentry work | 2 | " |
| Building and artistic iron work | 2 | " |
| Work of joiners and cabinet-makers | 3 | " |
| Tinsmiths' work | 2 | " |
| Whitewashers' and decorators' work | 2 | " |
| Mechanical engineering work | 2½ | " |
| Work in the graphic industries | 1½ | " |
| Optional work | 5 | " |
| Total | 24 | months |

It is recommended that the optional work be done in one of the following fields: Stone-cutting, glazing, plumbing, paper-hanging, electro-work, lithographing, bookbinding. It is not expected that candidates will acquire great mechanical dexterity by means of this practical activity in industrial life, but it is hoped that a clear and comprehensive survey of the whole industrial world can be made, and attention be paid to the different processes of work. During the time of practical work in the industry, which is included in the preparation for the profession of industrial teacher, it is especially important that the candidates comply exactly with the same methods of business and times of

work as the ordinary worker in the industry. At the close of this work, the candidate must present a certificate given by the manager of the business he has been in. In some cases State support will be granted to facilitate this training in the industries.

### Vacation Employment

A certain amount of vacation employment is demanded of students in the Karlsruhe school, although this is not reckoned as practical experience in the industries. This vacation employment includes:

| | |
|---|---|
| Mason work | 1½ months |
| Building and artistic iron work | 1½ " |
| Work as joiner and furniture-maker | 1½ " |

The Director of the school prescribes the kind of drawing and practical work to be done during the vacation.

Those attending the industrial teachers' department of the Building-Trades School of Karlsruhe are further required to attend all excursions prescribed by the Director of the school to industrial plants of the neighborhood. When necessary, some pecuniary assistance will be given to those employed during the vacations or taking part in the excursions. All students in the school are required to take part in the seminar practice. Each one in the Department must prepare one or two tasks, each semester, and, after the expiration of the time given for working it out must present it for approval.

### Karlsruhe Building-Trades School

A brief description of the Karlsruhe Building-Trades School follows, which states the general purpose of the institution and provides a detailed description of the work of the department for the training of industrial teachers:

The Karlsruhe Building-Trades School was founded in the year 1878 as a State institution. Its purpose is to train efficient men for the building, machine, and electrical trades, to prepare for work on a building or in the factory,

as well as to prepare technicians of middle rank to act as officials in the State and community. The instruction in theory must depend upon the practical needs of the industries.

The Building-Trades School also undertakes the education of industrial teachers. The learning of industrial handicrafts depends upon the practice of the building operations and the workshop, and must, in the case of all pupils of the Building-Trades School, precede their admission into the institution. Accordingly, the practical exercises which are carried on in a few classes in the institution are handled so as to lay the principal emphasis upon the theoretical development of the trade, and upon the solution of difficult problems. The successive classes last one-half year each. They may, with a few exceptions, be attended either in summer or winter, according to the personal convenience of the pupils.

### Aim and Organization of the Institution

The school consists of the following five divisions:

I. *Building-Trades Division.* — This division has the task of training State master-builders for the city and country, superintendents of buildings, draftsmen, and master-workmen, certificated by the State, as well as engineers of middle rank for State and community offices. The instruction is imparted in six classes, each of one-half year's duration. The sixth class, attended mainly by those who wish to take the State master-builders' examination, is carried on only in winter.

II. *Road-building and Hydraulic Engineering Division.*— The training of students in this division is given in six successive classes of one-half year's duration each. This division aims, first, at training engineers in the road and hydraulic service as officials for both State and community, as well as for industrial undertakings. While those finishing this division of the school are admitted to the State master-builders' examination, the under classes provide the necessary training for road-masters for the passing of their theoretical

examination. The building superintendents and draftsmen, as well as the street and dyke masters, find suitable opportunities for vocational education as soon as their introductory training and practice comply with the conditions of admission to the examination. The fifth class is carried on in summer, the sixth only in winter.

III. *Machine-Trades Division.* — This division undertakes to train machine engineers for the State bureau of construction and for the workshop. The instruction is imparted in five classes, each one of one-half year's duration. Those attending this division go later into various sorts of private industrial plants or apply to railway authorities of the country in order to devote themselves eventually to service as railway engineers, foremen, or master-workmen. Those finishing this course are qualified to take the State foremen's examination.

IV. *Electrical Division.* — The training of students in this division also falls into five successive classes, each of one-half year's duration, and during the first three semesters it is the same as that of students in the machine-trades division. The purpose of this division is to train electrical engineers for the bureau of construction and for the workshop, as well as for conducting the business of smaller electrical establishments and individual plants. After finishing this division they go either into the production of electro-technical products, or into the State or community offices, or into private electrical business. This division also offers to those young people who wish to establish themselves as independent workers in electrical installation opportunity for gaining the necessary knowledge. Those finishing this division are qualified to take the State foremen's or master-builders' examination.

V. *Division for the Training of Industrial Teachers.*— This division aims at preparing teachers to give the industrial and technical instruction prescribed by the laws of the country for the industrial schools, and is, of course, attended mainly by students who intend to devote themselves to the teaching profession. Candidates for positions

as industrial teachers must attend the institution seven semesters, and then pass the regular State teachers' examination.

Candidates who seek admission into the lower classes of the first four divisions of the school must have finished their sixteenth year. At the time of admission, candidates must pass an examination in German, arithmetic, and the theory of projection. Besides this, previous practical experience in the industries is demanded under all circumstances for admission into the lowest class of any of these four divisions. This practical experience must amount to at least two full years (twenty-four months), in which service in an office is not to be counted. The experience must be obtained as follows: (1) for the architectural division, in actual building operations; (2) for the road-building and hydraulic division, in actual work of this class; (3) for the machine engineer, in the machine shop; (4) for the electrical division, also in the machine shop, in the following proportions: for students with predominatingly machine-engineering training, the vocational work must take, from the minimum requirements of two years' experience, at least nine months in an electro-technical manufactory, in electro-technical business, or in fitting up electrical plants; students, on the contrary, who attend this division with predominatingly electro-technical experience must complete at least nine months' practice in general machine-building trades.

Besides this two years' practice or apprenticeship at entrance into the lower classes of the architectural, road-building and hydraulic work, machine trades, or electro-technical divisions, proof of attendance at an industrial school must be produced, if proof is not furnished of the finishing of the fifth class of a middle school. Students from an industrial continuation school can, only in exceptional cases and on account of especially good work, gain admission. It is important that pupils who possess the certificate for one year's military service or who have finished the classes of a middle school, mentioned above, should receive additional instruction in an industrial school

along with their practical work before their entrance into the building-trades school.

If a candidate for admission into the first class has taken some other preparatory course, he must prove a corresponding degree of knowledge by the passing of a special entrance examination. If students who expect to enter the first class of the architectural division (or who in the future will enter the profession of building contractor, superintendent of buildings, and the like) have had practice only as stone-cutters or carpenters, they are urged in their own interest to arrange for a longer period of practical experience in the mason trade before entering into business. Those, who have worked as cabinet-makers, glaziers, and the like, must, before entering the second or third class, show a longer practical experience in the mason trade.

In general, it is recommended that no long interruption of school attendance be permitted. Students who have dropped out of attendance at the institution for a longer period than three semesters, and who wish to re-enter on account of the new course of study, have to pass an examination in mathematics and constructional subjects to prove that they are qualified to attend higher classes.

The division for the training of industrial teachers is open only to those who bring proof of having been accepted as candidates for positions as elementary teachers or of having finished seven classes of a middle school. Applicants must be seventeen years of age, and must have finished at least three months' practical work in some large building business before entering the institution. Before attending the fourth class, elementary school teachers must complete at least a year of further practice, while those coming from the seventh class of a middle school must put in two years in practical work. It is recommended that students of the middle school finish one year of this practice before they enter, instead of the above named three months minimum amount.

During their vacations, or during the period of their

absence from school, in order that they may advance in their education and increase their understanding of national methods of building, students of the architectural division are directed to prepare photographs and drawings of fine old buildings and their parts. This serves as a preparation for subjects of instruction which form the substance of the course in the next higher class. The examples chosen are sketched under the direction of the teacher.

The students of the industrial teachers' division are required to make use of the great autumn vacation for some of the industrial handwork mentioned above. The Easter holidays, on the other hand, are used for the taking of photographs of buildings and artistic objects of all kinds. State assistance is at the disposal of both divisions to defray the expenses of visits to manufactories and the like, as well as to pay for well-prepared photographs.

Candidates in this division pay a matriculation fee of five marks. The tuition fee is forty marks for citizens of the Empire, and eighty marks for foreigners.

At the opening of every semester, instruction in hygiene is given to the new students, by the conductor of the so-called "Samaritan course." This course covers the principal points a student should know in order to preserve health of body and mind.

In order to promote acquaintance with graphic subjects, all students, from the lowest classes on, have to prepare sketch-books in an orderly way. The sketches in these books and photographs are, so far as possible, made use of in the instruction.

## EXCURSIONS

For the encouragement of nature studies, and for systematic training in observation, excursions to investigate available objects are undertaken, and wherever possible, sketches are prepared, to be worked out later in the classes.

Saturday afternoons are free from class-room work for the students, both in summer and winter. On these afternoons, as occasion arises, excursions are undertaken by

all divisions and classes in the school, for the purpose of inspecting buildings in course of construction, workshops, manufactories, roads, exhibits, and the like, as well as for practice in drawing in the open and in photographing agricultural buildings, monuments, and other objects worth reproducing.

Students of all divisions and classes take part in excursions in the week after Whitsuntide, which, as far as possible, cover all subjects which come under their attention in the course of study. These excursions are carried on so far as possible in the neighborhood of Karlsruhe, and, as a rule, extend over two days. In case of greater distances, three days are used. State aid is given to students to meet the cost of these excursions, and considerable reductions made in transportation rates. All students concerned must take part.

The course of study of the division for the training of industrial teachers is as follows:

FIRST CLASS

| | | |
|---|---|---|
| Mathematics | 4 | hours |
| Physics | 3 | " |
| Mechanics | 2 | " |
| Geometrical drawing | 2 | " |
| Descriptive geometry | 7 | " |
| Grammar of form, with sketches | 2 | " |
| Freehand drawing and painting | 22 | " |

SECOND CLASS

| | | |
|---|---|---|
| Mathematics | 3 | " |
| Physics | 4 | " |
| Chemistry | 3 | " |
| Mechanics | 2 | " |
| Descriptive geometry | 6 | " |
| Theory of building construction | 11 | " |
| Grammar of form and mechanical drawing | 4 | " |
| Freehand drawing and painting | 9 | " |

THIRD CLASS

| | | |
|---|---|---|
| Mathematics | 2 | hours |
| Chemistry | 4 | " |
| Theoretical mechanics | 2 | " |
| Descriptive geometry | 2 | " |
| Theory of building construction | 9 | " |
| Building models | 7 | " |
| Elementary mechanics | 1 | " |
| Grammar of form and mechanical drawing | 4 | " |
| Freehand drawing and painting | 9 | " |

FOURTH AND FIFTH CLASSES

| | | |
|---|---|---|
| Mechanics | 1 | " |
| Technology | 2 | " |
| Theory of building construction | 7–9 | " |
| Industrial technical models (building forms of wood and stone) | 2 | " |
| Technical drawings of parts of buildings and furniture | 5 | " |
| Practical geometry | 2 | " |
| Knowledge of machinery | 1 | " |
| Elementary machines | 2 | " |
| Machine drawing | 3 | " |
| Applied freehand drawing and painting | 8 | " |
| Bookkeeping | 4 | " |
| Political economy | 3 | " |

Introduction to industrial practice. . Time not fixed

(This item includes visits to workshops of different industries, and attendance at courses given for masters of different industries.)

Introduction to industrial school practice... 1 hour

(This item includes a survey of the development of industrial education and of its organization in Baden and Württemberg; the rules and decrees concerning management, organization, and instruction in industrial schools; general introduction to educational theory and practice; thorough treatment of instruction in mathematics, includ-

ing both arithmetic and geometry; study of materials; industrial correspondence and bookkeeping; written work; practice teaching in classes.)

SIXTH AND SEVENTH CLASSES

| | | |
|---|---|---|
| Technology | 1 | hour |
| Theory of the consumption of fuel | 1 | " |
| Theory of building construction, with working drawings | 9 | " |
| Theory of construction in iron | 2 | " |
| Technical models of metal, clay, class, and textiles | 3 | " |
| Industrial technical plans | 9 | " |
| Drawings of machinery | 3 | " |
| Electro-technology | 2 | " |
| Applied freehand drawing and painting | 8–9 | " |
| Knowledge of Baden (considering artistic buildings and monuments, and their preservation) | 1 | " |
| Building regulations of Baden, with consideration of its relation to Württemberg | 1 | " |
| Theory of exchange | 1 | " |
| Legal principles | 1 | " |
| Political economy | 3 | " |

Introduction to industrial practice..Time not fixed

(This includes visits to workshops of different industries, and attendance at courses given for masters of different industries.)

Introduction to industrial school practice.... 1 hour

(This provides for methodical teaching of the theory of projection; practical methods of construction in the different industries; technical drawing and modeling in the most important industries; written and graphic work; practice teaching in the Building-Trades School of Karlsruhe.)

CONCLUSION: These demands upon vocational teachers in Württemberg and Baden will seem very high to an American. Our American demands are not as a rule as exacting even as those of Prussia. In both Prussia and

America practical men and academic teachers are prepared for service in vocational schools by means of short courses. On the whole, I believe that Prussia demands more of such teachers than America.

The training of vocational teachers for the lower grades is more highly developed in South Germany than in Prussia or anywhere else in the world. In South Germany they have passed through the period when half-prepared teachers are permitted to undertake educational work of any sort. They have experienced the results of permitting misfit mechanics with little or no pedagogical training, and ordinary academic teachers with no technical training worth mentioning, to undertake the preparation of the youth for practical life. It is now realized that neither the half-trained mechanic nor the mere academic teacher can be in touch with actual industrial conditions. The South Germans endeavor, therefore, by their courses to train the teachers technically and the mechanics pedagogically. They encourage these vocational teachers to keep in touch with actual industrial and business conditions, both by constant visits to industrial plants and business operations, and by permitting them to carry on industrial and business occupations as a side issue. This practice is usually frowned upon in America, but in Germany it is believed that this will aid in keeping these schools practical, and will prevent them from developing into institutions that are completely out of touch with the needs of the time.

CONTINUATION SCHOOL FOR GARDENERS, MUNICH

## CHAPTER XVIII

# AGRICULTURAL SCHOOLS

THE first lower agricultural schools in the German Empire received their inspiration from Switzerland, where Pestalozzi and his friend Wehrli had organized an educational institution for poor orphan boys where, during their intermission from instruction, they were employed in agricultural work. A prominent reformer of German agricultural systems learned of these institutions during his repeated visits to Switzerland. When he founded the agricultural academy of Hohenheim in Württemberg in 1819, he united with it a lower agricultural school after the Swiss model, which undertook the education and instruction of ten orphan boys of fourteen years old. Similar institutions were called into life in Bavaria and Prussia, some of which were called "Wehrlischulen."

With the improvement in methods of cultivation the need arose for providing educational institutions for the sons of farmers in which they could learn a rational agricultural practice and at the same time receive some theoretical instruction in agriculture. Accordingly, since 1840, quite a number of lower agricultural schools have been founded which generally bear the name of "farmers' schools" (Ackerbauschulen). The schools already mentioned (Wehrlischulen) were gradually changed into these farmers' schools, which undertook the education of the sons of peasants whose ages ranged from 16 to 20. The farmers' schools were united with the management of a middle-sized farm. The pupils worked upon this farm, and formed a house community with the director and his family. The instruction was partly practical, partly theoretical; the practical instruction being given in the summer; the theoretical in the winter. The courses were usually two years in length.

In 1858, a purely theoretical farmers' school was founded in Hildesheim. Other schools have been organized on the same plan, until at present there are about eighteen such schools in Prussia. The reports of the last few years, however, show that the number is diminishing. The course of instruction in these schools usually consists of three classes corresponding to the three upper classes of a Realschule, often with a three-class preparatory school in connection. In other cases, these schools are combined with the Realschulen. Their diploma, since 1895, has been equivalent to that given by the Realschule. Their course of study is of corresponding length and difficulty, and the students graduating receive the certificate for one year's voluntary military service.

The elementary forestry schools, included among these technical schools, train foresters. The first forestry school in Prussia was founded in Gross-Schönebech in 1878 and was taken over by the State in 1883. A State apprentice school for foresters was opened in 1882 in Proskau. Besides this, since 1880, various forestry continuation schools for rangers employed for protecting the forests have been founded. Since October 1, 1905, several forestry continuation schools under the supervision of the higher schools of this kind have been opened, and one year's attendance in these has been made obligatory for all apprentices in the Prussian forestry service who have been in apprenticeship for a year.

Almost at the same time with these schools the first agricultural winter schools were founded. They attempted to make it possible for young sons of peasants to acquire a theoretical training without taking time from their summer's work. Instruction was given only in winter, but during this period all the time and strength of the pupil were demanded. As they required comparatively little expense from the parents, and were very successful in improving the agricultural work, their numbers increased very rapidly, until now there are over two hundred agricultural winter schools (201 in 1908).

In addition, numerous agricultural courses are given to train teachers for the agricultural continuation schools, and to instruct farmers and landlords in such special subjects as the science of agriculture, fertilization, the care and feeding of stock, horticulture, woodcraft, and the preservation of fruit.

The winter schools commonly offer two courses, which give the sons of peasants opportunities to acquire the knowledge demanded by a rational up-to-date system of farming.

In the first course the following subjects are taught:

| | |
|---|---|
| Political science, with composition | 4 hours |
| Arithmetic, including mensuration | 4 " |
| Surveying | 2 " |
| Chemistry of plants | 6 " |
| Science of agriculture | 6 " |
| Flower and fruit culture | 4 " |
| Care of horses and swine | 4 " |

In the advanced course the following subjects are taught:

| | |
|---|---|
| Law and equity | 4 hours |
| Chemistry, as applied to the food of animals | 4 " |
| Cultivation of meadows | 2 " |
| Care of animals and their diseases | 10 " |
| Business management and book-keeping | 2 " |

The following places in Prussia have agricultural schools: Bitburg, Bojanowo, Brieg, Cleve, Dahme, Eldena, Flensburg (combined with the Ober-realschule), Heiligenbeil, Herford (combined with the Realschule), Hildesheim, Liegnitz, Lüdinghausen, Maggrabowa (combined with the Realschule), Marienburg, Salzwedel, Samter, Schivelbein, Weilburg.

The agricultural schools in other German states are similarly organized. Bavaria has two institutions of this kind, one in Lichtenhof, near Nuremberg, and one in Pfarrkirchen, in lower Bavaria. The Saxon agricultural school is combined with the Royal Realgymnasium in Döbeln, as the Hessian is with the Grand-Ducal Realschule

in Gross-Umstadt. In addition there are well-known agricultural schools in Barel (Oldenburg), Helmstedt (Brunswick), and Rufach (Alsace-Lorraine).

Forestry academies, forestry colleges, or forestry institutions of other sorts exist in Prussia in the district of Hannover, in Münden and in Eberwalde; in Saxony in Tharandt; in Bavaria in Aschaffenburg; and in Saxe-Weimar in Eisenach. In addition to this the science of forestry can be studied in the universities at Giessen, Tübingen, and Munich.

Prussia has an agricultural college in Berlin, combined with institutions for the sugar industry and for the manufacture of yeast and starch, and one of Bonn-Poppelsdorf; Württemberg has one in Hohenheim, and Bavaria one in Weihenstephan. The universities of Breslau, Göttingen, Königsberg, Leipsic, Halle, Giessen, and Jena are equipped with agricultural departments. In these schools farmers receive scientific training in farming, surveying, and the cultivation of land. Veterinary colleges exist in Berlin, Hannover, Munich, Dresden, Stuttgart, and veterinary science is taught in the university of Giessen.

By the year 1903, the following elementary agricultural technical schools were established in Prussia:

| Institutions (and their number) | Teachers | Pupils | Revenue in Marks From the State | From Provincial District, Communal Funds, from Societies, from Endowments, etc. |
|---|---|---|---|---|
| 1. Agricultural Schools (16) | 189 | 2,366 | 397,656 | 175,358 |
| 2. Farming Schools (21) and Courses | 147 | 896 | 8,610 | 114,959 |
| 3. Agricultural Winter Schools (128) | 931 | 4,823 | 50,450 | 518,910 |
| 4. Schools for Meadow Cultivation (5) and Practical Courses | 44 | 565 | 5,800 | 29,380 |
| 5. Pomological Institutes and Schools for Gardeners (3) | 36 | 106 | 178,219 | 3,024 |
| 6. Schools of Horticulture, Viticulture, and Fruit-growing (15), Courses | 245 | 3,665 | 25,784 | 77,780 |
| 7. School for Sugar Manufacturing in Berlin | 5 | 28 | ..... | ..... |
| 8. Distillery School of the Society of Spirit Manufacturers in Berlin | 12 | 200 | ..... | ..... |
| 9. Students' Courses in Distillery at Schweidnitz | 5 | 33 | 900 | ..... |
| 10. School for Brewers of the Society "Experimental School of Brewery in Berlin" | 13 | 158 | ..... | ..... |

| | | | | | |
|---|---|---|---|---|---|
| 11. | Schools for Dairy-farming and Domestic Economy (64), Courses | 263 | 3,278 | 73,700 | 88,640 |
| 12. | Schools for Farriers (64), Courses | 100 | 747 | 5,100 | 9,580 |
| 13. | Schools for Beemasters (2) and Courses of Apiculture | 11 | 181 | 1,500 | 550 |
| 14. | Seminaries for Teachers of Agriculture (2) | 14 | 12 | 4,100 | ..... |
| 15. | Courses for Training Elementary Teachers for Rural Continuation Schools | 11 | 58 | 13,750 | ..... |
| 16. | Lecture Courses for Agriculturists, and Courses on Knowledge of Soils, Manures, Cattle-breeding, and Feeding | 21 | 697 | ..... | ..... |
| 17. | Courses in Bookkeeping | 7 | 260 | ..... | ..... |

| Federal State | Number of Agricultural Schools (Schools of Agriculture, Farming-Schools, Winter Schools and similar Schools) with a General Agricultural Curriculum in 1902–03 | Number of Pupils Attending these Schools in 1902–03. (Only Students of Agricultural Subjects are included.) |
|---|---|---|
| Kingdom of Bavaria | 48 | 1,534 |
| Kingdom of Saxony | 10 | 603 |
| Kingdom of Württemberg | 12 | 285 |
| Grand Duchy of Baden | 15 | 566 |
| Grand Duchy of Hesse | 11 | 382 |
| Royal Province of Alsace-Lorraine | 12 | 345 |
| The other Federal States, with the exception of Prussia | 25 | 1,043 |

## The report of 1908 shows the following situation:

| | |
|---|---|
| Agricultural Academies | 3 |
| Forestry Academies | 2 |
| Veterinary Colleges | 2 |
| Higher Gardening Schools | 3 |
| Agricultural Middle Schools | 18 |
| Lower Agricultural Winter Schools | 201 |
| Lower Special Schools: | |
| Meadow Culture Schools | 5 |
| Garden, Fruit, and Wine Schools | 16 |
| Dairy Schools | 14 |
| Schools for industries related to agriculture | 4 |
| Beekeeping Schools | 3 |
| Horseshoeing Schools | 65 |
| Poultrykeeping Schools | 7 |
| Forest Apprentice Schools | 4 |
| Housekeeping Schools: | |
| Stationary | 50 |
| Itinerant | 40 |
| Country Continuation Schools | 3,781 |

## CHAPTER XIX

# INDUSTRIAL EDUCATION IN AUSTRIA

### INTRODUCTION

INDUSTRIAL education in Austria began with the calling in of experts from foreign countries to give instruction to workmen. Dutchmen, Italians, Frenchmen, and Swiss were called in to give instruction in the glass and clothing industries. The first real provision for industrial education appears to have been the founding in 1758 of a manufactory drawing school in Vienna. In 1770, a commercial academy was founded in Vienna, but it did not meet with much success during the early years of its history. Trade and industry were hampered by restrictions and monopolies.

In the 70's, the Government endeavored to stimulate industrial education by the establishment of industrial schools of various sorts. These schools met with considerable success, and in 1790 there were 232 of them in Bohemia, mostly textile schools, but the whole movement declined during the closing years of the century.

In 1804, practical secondary schools were organized, "Realschulen," one of the objects of which was to educate pupils who expected to enter practical life. Later they also prepared candidates for the technical university or polytechnical school. Schools of this sort were established in Vienna, Reichenberg, Prague, Brunn, etc. In 1812, an art-trades institution for women's work was established in Vienna, and supported by private contributions. In 1806 a polytechnical institute was founded in Prague and in 1815 a similar institution was opened in Vienna, the first schools of the kind in central Europe, and the first, but one, in Europe. (The first was the polytechnical school in Paris, opened in 1795.)

Austria led all European nations in the founding of technical colleges. Berlin followed Vienna in 1821, Baden in 1825, Bavaria in 1827, Saxony in 1828, Württemberg in 1829, and Hannover in 1831. Austria was, however, behind Germany in the number and efficiency of her technical schools of lower and middle rank.

From 1851–67 the "Realschulen" increased in number and importance. These practical secondary schools provided some opportunity for industrial training. They offered instruction in freehand, mechanical, and ornamental drawing, geometry, natural science, business composition, commercial arithmetic, technology, machine and building trades, study of commodities, and technical chemistry. Between these years Austria possessed a system of secondary technical schools, but they did not seem to satisfy either the practical man or the polytechnical school.

In 1867 these schools were reorganized with especial view to making them better preparatory schools for the polytechnical school at Vienna. They became more scientific in their character and gave less attention to practical preparation for the industries. One important result of the change was that it made clear the necessity of a new type of industrial school.

In 1863, the museum for art and industry was founded in Vienna, modeled after the South Kensington Museum in London. About the same time, the reorganization of the old industrial drawing school of Vienna led to the founding of the Technological Museum and School in Vienna, which became a State institution in 1870.

The various polytechnical schools serve principally the great industries. After the reorganization of the "Realschulen" in 1867 the necessity for secondary technical schools became more and more apparent, and Austria, in the 70's, set about the organization of a system of lower and middle schools, including continuation schools, technical schools for special industries, and State industrial schools. A system of industrial schools was inaugurated that provided for every grade of industrial training. State industrial schools

were established and connected with the organization of local continuation schools. These central schools, by providing teachers for the continuation schools, by inspecting their work, and by maintaining a model school as one of their departments, give direction to the work of the continuation schools of the province in which they were located. A system of schools has been organized between the State Industrial Schools and the continuation school, including handicraft schools, and special technical schools for the various industries, in accordance with the needs of the local communities.

## THE PRESENT ORGANIZATION OF THE INDUSTRIAL SCHOOL SYSTEM OF AUSTRIA

### I. The Central Management

The entire industrial school system of Austria is under the management of the Ministry of Public Works, and is directly controlled by a Department of this Ministry, assisted by officials and commissions from the Department of Education and Commerce. The agricultural technical schools are under the control of the Ministry of Agriculture. The management of the technical schools of Austria is centralized to a greater degree than that of Germany. Boards and commissions of various kinds and of differing degrees of authority co-operate with the central authorities in the work of managing the industrial schools, the whole system being directed to a common purpose. It is, however, recognized that modifications must be made in the various divisions of the Monarchy on account of the character of the occupations and state of development of the various peoples, as well as on account of the differences in race and language existing in Austria. In some cities industrial schools have to be duplicated on account of the problem of language. In most of the cities of Bohemia you will find both German and Bohemian industrial schools. In Hungary the system of schools is independent of that of Austria, but the general outline of work is similar to that of Austria.

The industrial schools under the control of the Ministry of Public Works are classified in the following groups:

| Institutions | Number of Institutions | Number Attending |
|---|---|---|
| 1. Central industrial educational institutions | 9 | 20,653 |
| 2. Schools for important groups of trades (Staatsgewerbeschulen) | 24 | 15,946 |
| 3. Building and art-trades schools | 6 | 2,444 |
| 4. Special schools for single branches of industry | 128 | 15,157 |
| 5. Teaching workshops | 13 | 382 |
| 6. General handwork schools | 7 | 2,242 |
| 7. Industrial continuation schools | 1,137 | 148,446 |
| 8. Schools for the girls in industrial callings | 1,055 | 32,968 |
| Total | 2,379 | 238,238 |

The central industrial educational institutions are all located in Vienna except the art-trades school in Prague. They are as follows:

### *I. Bureau of Apparatus and Supplies for Industrial Educational Institutions.*

The purpose of this Bureau is to provide a constantly increasing supply of adequate apparatus for the industrial educational institutions of the Empire. The Bureau investigates all new products in the field of apparatus and school supplies, testing their utility for school use, manufactures new apparatus itself, and stimulates other industrial educational institutions to manufacture such apparatus and submit it to their approval, provides traveling exhibitions of apparatus and supplies, organizes courses of lectures on industrial subjects, arranges for prizes for the best plans submitted for manufacturing such apparatus, gives general instruction as to methods of producing drawing models and other work, and acts as a bureau of information and advice for those choosing educational apparatus.

The school supplies, including models, plans, maps, publications, engravings, etc., are secured:

1. By purchase.

2. Through periodical prizes given for the best pieces of apparatus or sketches of the same.

3. Through the preparation of apparatus in the Bureau itself; and in the State industrial educational institutions.[1]

The workshops or studios provided by the State industrial institutions are obliged to co-operate in the production of apparatus and supplies suited to the purposes of the Bureau, so far as it is possible without interfering with the ordinary work of the school. The production of this apparatus by the pupils themselves is often a part of the program of workshop instruction, and teachers in charge of such workshops, master-workmen, and foremen may undertake such work and receive remuneration therefor. The materials for the apparatus are usually supplied free of charge by the school management, but in some cases the authorities will substitute for this money payment for the material used. All apparatus and supplies must be prepared according to approved models or plans. All State industrial educational institutions are further obliged to assist the Bureau in every possible way in its plans for obtaining apparatus, by supplying it with duplicates of apparatus in their own collections, etc.

The furnishing of apparatus not produced by private establishments is sometimes free of cost, sometimes on payment of the actual cost of material. Petitions for the supply of apparatus for various continuation schools must be submitted to the inspector of such schools, who collects and investigates these petitions and forwards them to the Bureau with his recommendations twice a year. The different departments of the Bureau, art trades, textile, industrial continuation schools, and chemical-technical, carry on their work, having in view the especial needs of the educational institutions of the Empire.

### 1. Art-Trades Department

This department secures apparatus for the art-trades school or art-trades departments of other schools. 1. It provides apparatus suited for instruction in artistic forms

[1] The State Industrial School of Reichenberg manufactured in the regular course of instruction in its shops 142 pieces of apparatus, which were forwarded to the Bureau in Vienna.

of production, taking into consideration home art (including church art), inner decoration, wood-carving, sculpture, furniture, glass, artistic bronze smith-work, production of artistic textiles, ornamentation of gold and silver, ornamentation of books, heraldry and script. 2. The production and publication of patterns for inner decoration of churches and other buildings. The sketches or plans are partly obtained by purchase, partly prepared by the Bureau of Schools to meet the needs of individual classes. 3. The preparation and publication of model collections of objects generally useful in art-trade decoration, together with descriptions of the best processes. 4. The procuring and distribution of model collections, and of new raw materials applicable to the art-trades. 5. The periodical arrangement of traveling exhibitions of art-trade objects. 6. The holding of technical courses and lectures in art-trade subjects. 7. The preparation of candidates for the position of teachers of art-trade subjects as well as the further training of teachers already employed.

### 2. Textile Department

This department provides apparatus and supplies to industrial schools for the textile industries. It supplies apparatus and sample supplies for spinning, hand-weaving, and machine-weaving, for teaching of geometry and drawing, for finishing cloths, models of machinery for weaving, and for optical and photographic apparatus useful in the textile industries.

### 3. Department for Industrial Continuation Schools

The success of an industrial continuation school depends largely upon its supply of material and apparatus. Every good continuation school must have at its disposal a collection of models and apparatus sufficient to enable the teachers to give the pupils the vocational training provided for in the course of study. This department supplies schools with all sorts of models for drawing, including constructions in stone, wood, and metal, smith-work, ornaments of doors

and windows, joints for masonry, sheet-iron work, connections of piping, measuring instruments, tools, ornaments, parts of watches, ornaments of carriages, joinery, electrical devices, smith-work, furniture, drapery, etc.

It also procures maps and demonstrating models for instruction in the technology of working wood and iron and in the use of motors. It provides a collection of articles for instruction in teaching the subject of knowledge of materials used by masons, by producers of foods and manufacturers of clothing, etc.

The Department also provides for traveling exhibitions, for supplying the articles needed in establishing a new continuation school, the publication of technical books and pamphlets, and the institution of lectures.

### 4. Chemical-Technical Department

This department procures apparatus and materials needed in the field of chemical technology, and the publication of technical writings pertaining to this subject. It also holds technical courses and lectures and arranges for traveling exhibitions. The department supplies to the schools apparatus and materials needed in the field of the chemical technology of metals, woods, horn, ivory, tortoise-shell, amber and mother-of-pearl, stone, glass, and pottery, as well as for the chemistry of textiles and of the various processes used in decorative art.

In connection with its work in providing apparatus and supplies, the Bureau holds courses of instruction for wood-carvers, designers, textile industrialists, chemical cleaners and finishers, cabinet-makers, in coloring and staining of wood, courses of lectures for technical teachers in basket-making schools, courses for wagon-varnishers and painters in testing of colors, courses in methods of instruction in freehand drawing for teachers in the continuation schools, and technical courses in knowledge of materials used by bakers, and by teachers of this subject in the technical schools, technical courses in perspective for those

belonging to the trades of house-painting and decorating, and in the art of staining and varnishing violins.

COURSES CARRIED ON BY BUREAU OF APPARATUS AND SCHOOL SUPPLIES

| Subject Taught | Students |
|---|---|
| BUREAU OF APPARATUS AND SCHOOL SUPPLIES. | |
| (*a*) Technical course for wood carvers | 8 |
| (*b*) Technical course for designers—textile industry | 10 |
| (*c*) Masters' course in chemical cleaning and finishing | 56 |
| (*d*) Course for joiners in the cutting and dyeing of wood | 16 |
| (*e*) Preparatory course for special teachers in basket-making schools | 7 |
| (*f*) Course in wagon varnishing | 80 |
| (*g*) Course in methods of instruction in freehand drawing for men and women teachers in the continuation schools | 24 |
| (*h*) Technical course in the science of materials for bakers, and for teachers of these subjects in industrial technical continuation school for bakers | 15 |
| (*i*) Technical course in perspective for relations of the room and decorative painting | 10 |
| (*j*) Technical course in staining and varnishing violins | 1 |
| Total | 177 |

*II. Austrian Museum for Art and Industry, in Vienna.*

The Austrian Museum for Art and Industry was founded in 1863. It attempts to elevate and ennoble the taste of the industrialist and the general public both by instruction in the art-trades and by exhibitions of models. It is open to everyone.

The permanent exhibitions of this museum include collections of plaster casts, pieces of weaving, lace and embroidery, leather work, ceramic objects, glass work, goldsmiths' work, jewelry, enameling, and metal work. In addition to the permanent exhibitions of art-trade products, temporary exhibitions have been instituted which present to the public sample products of the art industry. The articles exhibited are sold to the general public by the museum authorities at such exhibitions. The copying and reproduction of the models are permitted in order to promote the formation of artistic taste. The institution furthers the same aim by holding courses of lectures on art-trade subjects and by the publication of art-trade journals.

The museum is equipped with machinery for making

plaster casts of the originals in the museum of art curiosities, ornaments of sculpture, etc., in order to make it easy for individuals and schools to secure models for their instruction in drawing.

An art-trades school opened in 1868 in connection with the museum trains industrialists for the art-trades and teachers in the art-trades schools.

### Art-Trades School of Vienna

| Subjects Taught | Number of Pupils | | | | | |
|---|---|---|---|---|---|---|
| | Complete Registration | | | At Close of School Year or Courses Remaining | | |
| | Students | Visitors | Total | Stud. | Visitors | Total |
| A. Department for — | | | | | | |
| (*a*) Ornamental and figurative drawing | 33 | 5 | 38 | 31 | 4 | 35 |
| (*b*) General department for modeling | 11 | .. | 11 | 11 | .. | 11 |
| B. Technical schools for — | | | | | | |
| (*a*) Architecture | 23 | 3 | 26 | 23 | 3 | 26 |
| (*b*) Painting | 25 | 4 | 29 | 23 | 3 | 26 |
| (*c*) Sculptures | 13 | 2 | 15 | 12 | 1 | 13 |
| C. Special departments for — | | | | | | |
| (*a*) Casting | 8 | .. | 8 | 8 | .. | 8 |
| (*b*) Wood-carving | 6 | .. | 6 | 6 | .. | 6 |
| (*c*) Enameling | 1 | 1 | 2 | 1 | 1 | 2 |
| (*d*) Carpet and Gobelin tapestry | 6 | 5 | 11 | 6 | 4 | 10 |
| D. Chemical laboratory work | .. | 1 | 1 | .. | .. | .. |
| E. Practical ceramic course | .. | 5 | 5 | 1 | 4 | 5 |
| F. Visitors in related subjects | .. | 30 | 30 | .. | 24 | 24 |
| G. Five special courses for masters and journeymen | 77 | .. | 77 | 68 | .. | 68 |
| Total | 203 | 56 | 259 | 190 | 44 | 234 |

### Art-Trades School of Prague

The art-trades school in Prague was founded in 1885. This school aims at the development of artistic power for the art industries, and the education of teachers for art-trade instruction, as well as for instruction in the secondary schools. It includes the following departments:

| Subjects Taught | Number of Pupils | | | | | |
|---|---|---|---|---|---|---|
| | Complete Registration | | | At Close of School Year or Courses Remaining | | |
| | Students | Visitors | Total | Stud. | Visitors | Total |
| A. General school for drawing and modeling | 108 | 13 | 121 | 103 | 11 | 114 |
| B. Girls' schools for— | | | | | | |
| (a) Drawing and painting | 29 | 14 | 43 | 25 | 13 | 38 |
| (b) Artistic embroidery | 7 | 2 | 9 | 7 | 2 | 9 |
| C. Special schools for — | | | | | | |
| (a) Decorative architecture | 16 | .. | 16 | 13 | .. | 13 |
| (b) Decorative modeling | 24 | 2 | 26 | 21 | 2 | 23 |
| (c) Decorative drawing and painting | 27 | 1 | 28 | 24 | 1 | 25 |
| (d) Industrial art for metal workers | 2 | .. | 2 | 1 | .. | 1 |
| (e) Plain patterns | 8 | 1 | 9 | 8 | 1 | 9 |
| D. Industrial art evening and Sunday courses — | | | | | | |
| (a) Evening course for figure drawing | 37 | .. | 37 | 31 | .. | 31 |
| (b) Evening course for ornamental drawing | 31 | .. | 31 | 23 | .. | 23 |
| (c) Evening course for architectural drawing | 40 | .. | 40 | 23 | .. | 23 |
| (d) Evening course for modeling | 37 | .. | 37 | 23 | .. | 23 |
| (e) Sunday course for geometry | 18 | .. | 18 | 13 | .. | 13 |
| Total | 384 | 33 | 417 | 315 | 30 | 345 |
| Total of the art-trades schools | 587 | 89 | 676 | 505 | 74 | 579 |

## 4. Teaching and Investigating Station for Graphic Arts, in Vienna

This institution teaches the most important methods of photography and other forms of reproduction used in printing and the illustration of books. Practical work in these lines of printing, photography, and other processes of illustrating is carried on in shops and laboratories.

It includes the following departments:

SUBJECTS TAUGHT

| Sections and Divisions | Students | Visitors | Total |
|---|---|---|---|
| I. Section. (School for photography and reproductive processes), first course in connection with the technical course for lithography and stone etching, preparatory class, 2 years | 194 | 125 | 319 |
| II. Section. (School for making and illustrating books) 2 years | 13 | 15 | 28 |

| | | | |
|---|---|---|---|
| Special courses, I. Sections: | | | |
| (*a*) Retouching for illustrative aims | 15 | ... | 15 |
| (*b*) In photographic printing and its artistic and industrial application | 22 | .. | 22 |
| (*c*) In photographic apparatus and supplies | 32 | .. | 32 |
| (*d*) In methods of enlarging photography | 33 | .. | 33 |
| Special course, II. Section: | | | |
| (*a*) In composition | 18 | .. | 18 |
| (*b*) In sketching | 41 | .. | 41 |
| Technical continuation school for apprentices in the trade of photography | 70 | .. | 70 |
| Total | 277 | 140 | 417 |

### 5. Technological Industrial Museum, in Vienna

This museum was founded in 1879. It is perhaps one of the most complete and best equipped institutions for industrial education in Europe. The following table shows the departments and work of the school:

| | SUBJECTS TAUGHT | | |
|---|---|---|---|
| Sections and Teaching Divisions of the Institute. | Students | Visitors | Total |
| I. Section. Special course for the paper industry | 7 | 2 | 9 |
| II. Section. Seminary and special course for the chemistry of foods: | | | |
| (*a*) Seminary for chemistry of dyes | 26 | .. | 26 |
| (*b*) For chemistry of foods | 6 | .. | 6 |
| III. Section. Technical school for building and machine locksmiths: | | | |
| (*a*) Lower technical school, 4 years | 206 | 14 | 220 |
| (*b*) Higher technical school, 2 years | 48 | 2 | 50 |
| (*c*) Special course for artillery masters, 2 years | 30 | .. | 30 |
| (*d*) Special course for chauffeurs | 4 | .. | 4 |
| (*e*) Special course for firemen and stationary engineers | 75 | .. | 75 |
| IV. Section. Technical school for electrotechnology: | | | |
| (*a*) Lower technical school (preparatory class), 3 years | 205 | 5 | 210 |
| (*b*) Higher technical school, 2 years | 43 | 4 | 47 |
| Nineteen special courses with evening and Sunday instruction | 467 | .. | 467 |
| Nine special courses of the Gremial commercial school of the Vienna merchants | 383 | .. | 383 |
| Special teachers' course in industrial technique | 38 | .. | 38 |
| Total | 1,538 | 27 | 1,565 |

### 6. Teaching and Investigating Station for the Leather Industry

This was opened in Vienna in 1874. It attempts to carry out severe methods of scientific investigation in the

field of leather products, and to transfer the results gained into practice. It tests the usability and value of new materials and recipes used in the industry; it carries out all sorts of investigations at the request of the authorities, unions, or private individuals. It circulates the results of its investigations by word and writing, and communicates advice and instruction to all persons in the leather industry. The instruction consists of both theoretical and practical courses.

### 7. School for Artistic Embroidery

The school for artistic embroidery was erected in Vienna in 1874, for the purpose of training female art workers in embroidery. The school strives to furnish training in all branches of embroidery, to revive the old methods of art embroidery and to introduce new ones, and to promote the preparation of more artistic patterns. The training of the taste is secured by connecting art embroidery with the study of art in general. The course is five years in length. Those who complete it are prepared to work and teach artistic embroidery in other schools. A course has recently been added for the restoration of carpets and Gobelin tapestry.

### 8. Institutions for Women's Industries

The central institution was opened in Vienna in 1879. It aims to train needle-workers, already possessing some skill in the use of the needle. The course has three divisions: for sewing, for pillow-lace making, and for embroidery, each lasting ten months. Connected with this central institution there are 37 associated institutions in the Empire for pillow-lace making with 10,726 students, 8 associated institutions for sewing with 881 students, and 6 other associated institutions for embroidery with 315 students, affiliated associations for crocheting with 3,270 pupils, 20 for pillow-lace making with 991 pupils, 3 for embroidery with 120 pupils, 113 courses in all.

### 9. Model Teaching and Investigating Station for Basket-Weaving

This model workshop was erected in 1886 for the training of basket-makers for efficiency. In the school they produce patterns for the basket-making schools of the Empire. Connected with the school is a model willow garden, which serves as an instrument of instruction for the workmen in the school, and as a station for the investigation of materials. The central station is composed of a masters' school and a course of instruction for visitors. There are associated with it 3 technical schools for basket-makers, 5 apprentices' work-shops, and 20 itinerant courses for basket-makers.

These central institutions set the pace for Austria, and are, as a rule, schools of remarkable efficiency. The Bureau for apparatus and school supplies is especially interesting for two reasons: First, it undertakes to furnish all schools with the best apparatus available for their purpose and prevents their being exploited by fraudulent concerns. Second, the arrangements provide a market for the vast quantities of work done in the school shops, without getting the school into trouble with the industries. One of the difficulties of the ordinary school shop is that its products must be stowed away in spare rooms and treated merely as a curiosity. A student making articles for this purpose never has the feeling that he is producing something under commercial conditions, and the result is unfortunate from the standpoint of pedagogy as well as economy. The Austrian scheme utilizes this material in a very systematic way, and stimulates the very best kind of work on the part of the pupils and teachers who make the apparatus. As every piece must pass the inspection of experts, everyone will do his best, and the school workshop will become an efficient agent in industrial education. Similar attempts to utilize products of pupils' work are made in many German schools, but, on account of the lack of a central organization, the attempts are not so successful as in Austria.

### State Industrial Schools

These schools, like the "Technika" of South Germany, undertake to furnish secondary industrial education in the group of industries represented in any large section of the Empire, including some combination of the following groups of trades: building-trades, machine-trades, art-trades, technical-trades, electrical-trades, and chemical-trades. The school undertakes to cover the particular trades most in demand in the section where the school is located. There are twenty-three of these schools in Austria, located in the various capital cities. They always include, besides the above mentioned groups of trade schools, model continuation schools which have the advantage of the trained industrial teachers,[1] and a technical school building and equipment. The State Industrial Schools, besides training youth for the industries, train teachers for the lower industrial schools of the section, and to some extent act as supervisors of the lower industrial school work.

These State Industrial Schools are intended to serve the whole circle of industries of a district. Their entire apparatus, teaching personnel, and equipment, must be more comprehensive than those of an industrial technical school for a single branch of an industry. Such schools can only be founded where there is a great center of industries related to each other. Such schools may be regarded as a combination of several technical schools for special industries, the name "State Industrial School" expressing an administrative, not a pedagogical, idea. The pedagogical centers of these schools are the technical schools of various industrial groups included in the school. There is a great advantage in combining these groups in one State school, as they may easily use one building and much of the general equipment and organization will serve for all. The instruction within the groups remains entirely separate.

The individual technical schools within this State

[1] These model continuation schools are extremely important in the Austrian scheme, as they demonstrate what a continuation school can and ought to do.

Industrial School are divided into a higher and a lower group, depending upon both the preparatory training required and the general purpose of the school.

1. The higher technical department admits only pupils who have received a good elementary school education. The course is four years in length, and includes both theoretical and practical training. Students are urged to put in time during the vacations in actual work in the industries, in addition to the laboratory and workshop instruction of the school. In the building-trades section the student must put in a semester in building operations between the first and second semesters of the third year of the course. The purpose of this school is to prepare pupils to fill prominent, responsible, well-paid positions in the great industrial undertakings, or to enable them to carry on the independent practice of an industry. The art-trades department trains workers in responsible positions of the art-trades and teachers for art-trade instruction. The building department trains future master-builders or contractors, etc.; the mechanical-technical department prepares manufacturers and managers of factories for their work; the technical department instructs leaders for the spinning and weaving establishments; the chemical-technical department attempts to educate managers and technical assistants in coloring, printing, and bleaching, as well as for the manufacture of sugar, glass, and chemicals generally.

The course of instruction varies according to the aim of each department. During the holidays the pupils are given opportunity for practical work in the trade chosen by him. Practical instruction in the mechanical-technical department is provided in the mechanical workshops and laboratories, while the chemical department has both general laboratories and laboratories for special instruction. Under the new regulations places must be provided in the basement of the school or on the school grounds for practical work for those in the building trades, in addition to their outside work during their vacations. The students completing the four years' course in one of these departments receives the

## MECHANICAL-TECHNICAL DEPARTMENT OF THE STATE INDUSTRIAL SCHOOL, HIGHER DIVISION

| Subjects | Hours per Week Winter Sem. | Summer Sem. |
|---|---|---|
| **1ST CLASS** | | |
| German | 5 | 5 |
| Geography | 3 | 3 |
| Physics | 4 | 4 |
| Chemistry | 3 | 3 |
| Mathematics (algebra and geometry) | 7 | 7 |
| Geometrical and projective drawing (2 hours lectures, 4 hours drawing) | 6 | 6 |
| Technical freehand drawing (2 hours lectures, 4 hours drawing) | 6 | 6 |
| Stenography | (1.5) | (1.5) |
| Total | 34 (35.5) | 34 (35.5) |
| **2D CLASS** | | |
| German | 3 | 3 |
| Geography and history | 3 | 3 |
| Physics | 4 | 4 |
| Chemistry | 4 | 4 |
| Mathematics (algebra and geometry) | 10 | 6 |
| Theory of projection (3 hours lectures, 4 hours drawing) | 7 | 7 |
| Elements of machinery (2 hours lecture, 4 hours drawing) | 6 | 6 |
| Mechanical technology | .. | 3 |
| Mechanics | 4 | 4 |
| Stenography (not obligatory) | (1.5) | (1.5) |
| Total | 41 (42.5) | 40 (41.5) |
| **3D CLASS** | | |
| German | 3 | 3 |
| Geography and history | 3 | 3 |
| Chemical technology | 2 | 2 |
| Mathematics (algebra and geometry) | 5 | 3 |
| Mechanics | 6 | 5 |
| Machine building (5 hours lectures, 9 hours drawing) | 14 | 14 |
| Mechanical technology | 3 | 4 |
| Electrotechnology | 2 | 2 |
| Bookkeeping | 2 | 2 |
| Theory of building | 2 | 2 |
| Total | 42 | 40 |
| **4TH CLASS** | | |
| German | 3 | 3 |
| Geography and history | 3 | 3 |
| Mechanics | 5 | 3 |
| Machine building, 1st division (4 hours lectures, 7 hours drawing) | 11 | 11 |
| Machine building, 2d division (4 hours lectures, 8 hours drawing) | 12 | 12 |
| Mechanical technology | 4 | 4 |
| Electrotechnology | 4 | 4 |
| First aid to the injured (not obligatory) | (1) | .. |
| Total | 42(43) | 40 |

BUILDING DEPARTMENT OF THE STATE INDUSTRIAL SCHOOL, HIGHER DIVISION

| Subjects of Instruction | Number of Hours per Week | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1st Sem. | | 2nd Sem. | | 3d Sem. | | 4th Sem. | | 1st–4th Sem. School Year |
| | 1½ Yrs. | 2 Yrs. | 1½ Yrs. | 2 Yrs. | 1½ Yrs. | 2 Yrs. | 1½ Yrs. | 2½ Yrs. | |
| Language | 4 | 4 | 3 | 3 | 3 | 3 | 2 | 3 | 12.5 |
| Geography and history | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 12 |
| Mathematics | 8 | 8 | 7 | 6 | .. | .. | .. | .. | 14.5 |
| Physics | 4 | 4 | 3 | 4 | .. | .. | .. | .. | 7.5 |
| Chemistry | 3 | 3 | 3 | .. | .. | .. | .. | .. | 4.5 |
| Geometrical and projective drawing, study of projection and perspective | 6 | 2 | 5 | 5 | .. | 2 | .. | .. | 10 |
| Freehand drawing | 7 | 5 | 5 | 6 | 8 | 6 | .. | .. | 18.5 |
| Theory of materials | .. | .. | .. | 2 | .. | .. | .. | .. | 1 |
| Architecture | .. | 3 | 3 | 3 | 3 | 4 | 4 | 6 | 13 |
| Drafting and plan drawing | .. | 3 | 3 | 3 | 7 | 7 | 13 | 18 | 27 |
| Building forms and architecture | .. | .. | .. | .. | 6 | 6 | 4 | 4 | 8 |
| Theory of mechanics | .. | .. | .. | .. | 5 | 4 | 4 | .. | 6.5 |
| Theory of construction | .. | .. | .. | .. | .. | .. | 3 | 3 | 3 |
| Theory of machinery | .. | .. | .. | .. | 3 | .. | .. | .. | 1.5 |
| Theory of road surveying | .. | .. | .. | .. | .. | .. | 4 | .. | 2 |
| Fundamental principles of building and hydraulics | .. | .. | .. | .. | .. | 4 | 4 | .. | 4 |
| Business correspondence and bookkeeping | .. | .. | .. | .. | .. | .. | 2 | 2 | 2 |
| Practical exercises in building in the school yard | 4 | 4 | 4 | 4 | .. | .. | .. | .. | 8 |
| Sanitation | .. | .. | .. | .. | 1 | .. | .. | .. | .5 |
| Total | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 156 |

Work on the Buildings

coveted certificate granting the privilege of one year's voluntary military service.

2. The lower division of these schools, formerly called master-workmen or foremen's departments, includes usually two years of instruction, but in the case of the building-trades department three semesters only, one a preparatory course for those deficient in theory or practice. As has been pointed out, the master-workmen's school may cover the same technical departments as the higher technical school, but usually has only two, the building-trades and the mechanical-technical. The pupils are recruited from young persons who have already fully or partly learned the trade, and who seek to acquire the theoretical knowledge

## SCHOOL FOR BUILDERS OF THE STATE INDUSTRIAL SCHOOL, FOREMEN'S DIVISION

| Subjects of Instruction | Number of Hours per Week in | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Preparatory Course | 1. Technical Course for | | | 2. Technical Course for | | | Master Course for Masons |
| | | Masons | Carpenters | Stone Masons | Masons | Carpenters | Stone Masons | |
| Language and business correspondence | 6 | 2 | 2 | 2 | .. | .. | .. | .. |
| Geography | .. | 1 | 1 | 1 | .. | .. | .. | .. |
| Arithmetic | 6 | 3 | 3 | 3 | .. | .. | .. | .. |
| Geometry | 3 | 3 | 3 | 3 | .. | .. | .. | .. |
| Natural science | 3 | 3 | 3 | 3 | .. | .. | .. | .. |
| Technical drawing and study of projection | 10 | 4 | 4 | 4 | .. | .. | .. | 3 |
| Freehand drawing | 8 | 4 | 4 | 4 | 4 | 2 | 4 | .. |
| Study of materials and stone | .. | 2 | 1 | 2 | .. | .. | .. | 1 |
| Architecture, technique | .. | 6 | 6 | 6 | 6 | 4 | 6 | 4 |
| Plans and structure of buildings | .. | .. | .. | .. | 2 | 2 | .. | 2 |
| Drafting, technical drawing, plan drawing | .. | 10 | 10 | 10 | 18 | 18 | 18 | 16 |
| Building forms, architecture | .. | 4 | 3 | 4 | .. | .. | .. | 3 |
| Theory of machinery | .. | .. | 2 | .. | .. | .. | .. | 2 |
| Theory of construction | .. | .. | .. | .. | 2 | 2 | 2 | 1 |
| Building mechanics | .. | .. | .. | .. | 4 | 4 | 2 | 4 |
| Bookkeeping | .. | .. | .. | .. | 2 | 2 | 2 | 1 |
| Civics | .. | .. | .. | .. | 1 | 1 | 1 | 1 |
| Sanitation | .. | .. | .. | .. | 1 | 1 | 1 | 1 |
| Theory of surveying | .. | .. | .. | .. | 2 | 2 | .. | 3 |
| Practical exercises for masons. Workshop instruction for carpenters. Workshop instruction and modeling for stonemasons. | 4 | 4 | 4 | 4 | 4 | 8 | 10 | .. |
| Fundamental principles of road-building and hydraulics | .. | .. | .. | .. | .. | .. | .. | 4 |
| Total | 40 | 46 | 46 | 46 | 46 | 46 | 46 | 46 |
| OPTIONAL SUBJECTS | | | | | | | | |
| Second language | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Gymnastics | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

and skill necessary for the independent industrialist or master-workman. Applicants must have completed their sixteenth year, have completed the elementary school, and have put in at least two years in practice in the building or other trades. The course accordingly is extremely practical. The theoretical part is reduced to the minimum required for the intelligent practice of the trade. The master-workmen's school in connection with the art-trades, the mechanical-engineering trades, and the chemical department has the use of special laboratories, the same as students in the higher department of the school.

The teachers of the State industrial schools are partly persons trained in the technical universities or art-trades schools, and partly teachers from the ranks of the middle schools. The teachers are required to be in close touch with the industries, and to take a definite interest in the industrial work of the district surrounding the school. They are usually employed during a portion of the year in practical work in the industries, the authorities believing that in this way the teachers can be kept up to date. Teachers are encouraged to travel, and to engage in special study of the special industries.

### Technical Schools for Single Branches of Industry

These technical schools serve to promote production in the individual industries prevailing in special localities. They are needed not only in the great industrial centers, but in small, out-of-the-way places, outside of the great current of the commerce of the world, where some definite industry has attained a very great importance. These schools are divided into six branches, as follows:

1. Technical schools for lace work and artistic embroidery;
2. Technical schools for weaving and embroidery;
3. Technical schools for the wood and stone industries;
4. Technical schools for fancy wares, ceramics, and the glass industry;

5. Technical schools and investigating institutions for the metal industry;

6. Technical schools and investigating institutions for general purposes.

A second problem of these schools consists in the revival and improvement of the house industries, which are still actively carried on in many regions of Austria, and offer a supplementary means of earning a livelihood. By keeping these industries in touch with modern demands, the industrial school confers an important service upon the community in which it is situated, and often enables the house industries to compete in the markets of the world. These special schools form centers of a local industry in a way not easily comprehended by an American. It is sometimes hard to believe the statements made with reference to the practical assistance of one of these schools to the industries surrounding it. It took a practical demonstration of this fact at Gablonz in Austria and at Solingen in Germany to convince the author of the very close relations existing between such a school and the industries.

The organization of these technical schools is very simple. Their main consideration is keeping in touch with the local industry, and supplying this industry with every possible aid through the applications of science and art. There are schools with one teacher and six pupils, and schools with twelve or more teachers and hundreds of pupils. Local conditions and the importance of the branches of production will determine the organization, which must be suited to conditions of production. One common characteristic can be observed in all these schools: they devote especial care and attention to the work in drawing.

The duration of instruction varies from six months to four years. Applicants must usually have received an elementary school education or its equivalent, and have completed their fourteenth year. The final certificate of the best of these schools authorizes the persons leaving them to carry on the trade learned in the school without serving an apprenticeship. The Minister of Public Works designates the

institutions whose certificate confers this privilege. The teachers of these schools are both pedagogically trained teachers and practical men from the industries. The practical men have usually taken the course in a State industrial school. The management of the school is usually entrusted to persons who have been trained at a technical university. In many cases they are architects or engineers. Teachers in the art-trade subjects are for the most part selected from those who have been trained in the art-trades school connected with the Vienna Art-Trades Museum. The work-shops are under the charge of master-workmen who are often former students of the school itself or have been long employed in some great industrial establishment as foremen or master-workmen. Through these shops under this competent instruction the

COURSE OF STUDY OF THE ART-TRADES SCHOOL IN GABLONZ.

| Subjects | 1st Year | | 2nd Year | | 3rd Year | |
|---|---|---|---|---|---|---|
| | | | Divisions for | | | |
| | Metal Workers | Ceramic Workers | Metal Workers | Ceramic Workers | Metal Workers | Ceramic Workers |
| Freehand drawing | 12 | 14½ | 6 | 8 | 6 | 6 |
| Geometrical drawing and geometry | 6 | 6 | .. | .. | .. | .. |
| Descriptive geometry and light and shade | .. | .. | 6 | 6 | .. | .. |
| Industrial-art technical drawing | .. | .. | 4 | .. | 8 | 8 |
| Decorative painting | .. | 11½ | .. | 6 | .. | 6 |
| Decorative painting of flowers | .. | 11½ | .. | 6 | .. | 6 |
| Modeling in clay and wax | 10 | .. | 8 | .. | 8½ | .. |
| Forms of ornaments | .. | .. | 2 | 2 | 2 | 2 |
| Heraldry | .. | .. | 1 | | | |
| Lettering | 1 | 1 | .. | .. | .. | .. |
| German and business correspondence | 2 | 2 | 1 | 1 | .. | .. |
| Industrial arithmetic and bookkeeping | 2 | 2 | 2 | 2 | .. | .. |
| Commercial geography | .. | .. | 1 | 1 | .. | .. |
| Workshop instruction — Engraving of castings and embossing of lead; Engraving; Trinkets | 17 | .. | 20 | .. | 25½ | .. |
| Painting on glass, porcelain, and majolica | .. | 13–14 | .. | 20 | .. | 28 |
| Weekly | 50 hours | | 50 hours | | 50 hours | |

school attempts to offer a substitute for apprenticeship. Quite a number of schools seem to be fairly successful.

### General Handicrafts Schools

The technical schools above mentioned take pupils after the completion of their fourteenth year, when the majority of the individuals from the industrial classes enter an industry or an advanced school. These advanced schools, industrial or otherwise, are open to only a small portion of the working people. The general handicrafts school takes pupils at the completion of their twelfth year, therefore, during the compulsory school age, and offers them an opportunity for industrial training preparatory to apprenticeship. The training is not directed towards any one industry during the first year, but later the pupils are permitted to specialize. The school resembles the London pre-apprentice schools, and seemed to Dr. Kerschensteiner in 1900 destined to take an important place in any complete system of industrial schools. At the present time, however, the special school at Linz, described by Dr. Kerschensteiner, has been changed to a State Industrial School, and the ones at Tetschen and Klagenfort have been changed into building and art-trades schools, including, however, the above mentioned "handicrafts" department. Students completing the handicrafts school seemed to have been unable to secure any concession from their masters, but were required to put in the same amount of time in apprenticeship as those who had remained in the elementary school. As a result, these boys went into the great factories or, if circumstances permitted, went further in industrial school work. The only schools remaining in Austria of this type are the Bohemian schools. All of the German schools have been changed into some other type of industrial school.

The course in the general handicrafts school is from two to three years, continuing some of the elementary school subjects, but adding a number of technical subjects. Great attention is devoted to drawing with manual training work. The shops I saw were especially good. Usually

industrial continuation schools and open drawing halls are combined with the general handicrafts schools. Teachers are either technically trained or they are teachers from the elementary schools. The schools are regarded as expensive, and do not seem to have met with the approval of the employing class. They are especially interesting to Americans and Englishmen, as there is a strong tendency at present to turn the seventh and eighth grades into the sort of a school called by the Austrian "the general handicrafts school." The school I am most familiar with in Austria was an excellent one, and it was a great surprise to me to learn through the Director of the State Industrial School at Reichenberg the reason for modifying the experiment in Tetschen.

GENERAL HANDICRAFTS DEPARTMENT IN SCHOOL IN TETSCHEN.

| Courses of Study | Number of Hours 1st Class | 2nd Class |
|---|---|---|
| OBLIGATORY COURSE — | | |
| Religion | 1 | 1 |
| Study of languages | 4 | .. |
| Business correspondence and general industrial laws | .. | 3 |
| Geography | 2 | 1 |
| Natural science | 2 | 3 |
| Study of materials | 2 | 2 |
| Industrial arithmetic | 3 | 3 |
| Industrial bookkeeping | .. | 1 |
| Freehand drawing | 6 | 4 |
| Geometry | 2 | 1 |
| Geometrical and projective drawing | 4 | 3 |
| Technical drawing | .. | 6 |
| Penmanship | 1 | .. |
| Modeling | .. | 4 |
| Workshop instruction | 9 | 10 |
| Total | 36 | 38 |
| OPTIONAL COURSE — | | |
| Second language | 3 | 3 |
| Gymnastics | 2 | 2 |

### BUILDING AND ART-TRADES SCHOOLS

This is practically the master-workmen's division of the State Industrial School with art-trade courses added. In the building trades they have, as in the State Industrial School, three semesters of work, including the preparatory year. In many schools they include special courses for masons, carpenters, cabinet-makers, blacksmiths, and house-

painters. In those that were formerly general handicrafts schools a department for boys under fourteen is included, with only two years of work. The building-trades department of the school, however, is the most prominent and important. Continuation school courses are added for apprentices in the building and art-trades.

The school in Tetschen contains the following departments:

1. Department for "general handicrafts" for boys under fourteen.
2. Building and art-trade courses for
   (*a*) Builders and painters (house).
   (*b*) Cabinet-makers and locksmiths.
3. Special courses for firemen and stationary engineers.
4. Special courses for electricians of lower grade.
5. Open drawing hall.
6. Industrial continuation school.

### Apprentice Workshops

Austria has thirteen apprentice workshops, with 339 pupils. Ten of these apprentice workshops are in the Polish districts, and three in the German districts. These shops train apprentices in various trades, and entirely replace the usual apprenticeship to a master, usually during a term of three years. In Austria there are such shops for weavers, wagon-makers, blacksmiths, joiners, basket-makers, small iron industrialists, shoe-makers, and watch-makers. These shops are also found in Switzerland and Germany, but do not seem to be increasing in number or popularity. They are somewhat expensive, and usually are unpopular with the labor unions. They correspond roughly with what are commonly called "trade schools" in the United States. I found little or no interest in such institutions, with the possible exception of the ones at Bern and Winterthur in Switzerland, and the ones at Augsburg and Fürth in Germany. None of these, however, seem to be making much progress so far as development in number of pupils and popularity is concerned.

## Continuation Schools

The continuation schools of Austria are very much like those of Germany. They are divided according to their purpose into two principal groups:

A. General industrial continuation schools;

B. Technical continuation schools.

A. The general continuation schools take into consideration in their course of study the general industrial situation of the place where they are located. They usually consist of two or three classes, with a preparatory class where such is necessary. The preparatory class attempts to give instruction in the elementary school subjects of reading, writing, and mathematics to pupils who are defective in these branches.

The instruction lasts from seven to eight months, and is given usually in the evening before eight o'clock and on Sunday forenoons. Efforts are now being made to transfer the instruction to the usual hours of work during the week. The Austrians find the same difficulty in educating tired and

COURSE OF STUDY OF THE GENERAL INDUSTRIAL CONTINUATION SCHOOLS

| Subjects of Instruction | Number of Hours Per Week | | | |
|---|---|---|---|---|
| | Preparatory | Class I. | Class II. | Class III. |
| Language | 2 | .. | .. | .. |
| Penmanship | 1 | .. | .. | .. |
| Arithmetic | 2 | .. | .. | .. |
| Drawing | 2 (3) | .. | .. | .. |
| Geometry and theory of projection | .. | 1 | .. | .. |
| Geometrical projection and freehand drawing | .. | 3 (4, 5) | .. | .. |
| Technical drawing | .. | .. | 4 (5, 6) | 4 (5,6) |
| Business and industrial composition | .. | 2 | 1 (1,5) | .. |
| Industrial arithmetic and industrial bookkeeping | .. | 2 | 3 | .. |
| Theory of materials, and the like — | | | | |
| (a) For mediums of food and drink | .. | .. | .. | 3 |
| (b) For bricklayers and stonemasons | | | | |
| (c) For dressmaking industry | | | | |
| Technology and theory of motors — | | | | |
| (a) Technology for wood-working industry | .. | .. | .. | 3 |
| (b) Technology for metal-working industry | | | | |
| (c) Theory of motors, the same for both groups | | | | |
| Civics | .. | .. | .. | 1 |

worn-out children as the Germans and others have experienced.

B. Technical continuation schools provide apprentices and journeymen of special industries or groups of industries opportunity for further education. Commercial continuation schools may be counted as schools of this type. The best of these technical continuation schools are found united with the industrial day schools of the country. In the larger cities there are numerous other technical continuation schools of this type, but, taking the country as a whole, they constitute a very small minority. Of the 1,137 continuation schools of Austria, 180 are reported as being technical continuation schools. This, however, appears to omit the technical classes united with the day industrial schools above mentioned. Many of these technical continuation schools have school workshops in connection with their other instruction. This, of course, is true of those combined with the industrial day schools. The tendency is strongly in favor of having shop instruction to supplement the instruction obtained outside of the school.

These continuation schools are supported largely by local authorities, but about one-third of their yearly expenditures are contributed by the State. The State manifests its interest in these schools in other ways:

1. By its support of the model continuation schools in the State day continuation schools;

2. By the production and supply of apparatus, mentioned in connection with the Bureau of Apparatus and School Supplies;

3. By training teachers in courses given usually in State Industrial Schools.

The trade regulations of the State oblige employers to provide for their employes, up to the completion of their eighteenth year, the time required for attendance at the continuation school. The master is required to watch over the morals and conduct of the apprentice, and to supervise his school attendance. Within certain limits, the schools may be called compulsory.

Below is a program of the technical continuation schools for apprentices:

COURSE OF STUDY OF THE TECHNICAL CONTINUATION SCHOOL

| Subjects of Instruction | Technical Continuation Schools without Workshop Instruction | | | | | | Technical Continuation Schools with Workshop Instruction | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Hours per Week | | | | | | Number of Hours Per Week | | | | | |
| | Prepar. | Special Classes | | | Total | Per Cent. | Prepar. | Special Classes | | | Total | Per Cent. |
| | | I | II | III | | | | I | II | III | | |
| Language | 3 | .. | .. | .. | 3 | 9.4 | 3 | .. | .. | .. | 3 | 7.5 |
| Arithmetic | 3 | .. | .. | .. | 3 | 9.4 | 3 | .. | .. | .. | 3 | 7.5 |
| Industrial-commercial instruction (business correspondence, arithmetic, calculation, bookkeeping) | .. | 3 | 2 | 1 | 6 | 18.8 | .. | 3 | 2 | 1 | 6 | 15 |
| Civics | .. | .. | .. | 1 | 1 | 3.1 | .. | .. | .. | 1 | 1 | 2.5 |
| Technical drawing | 2 | 3 | 4 | 4 | 13 | 40.6 | 2 | 3 | 3 | 3 | 11 | 27.5 |
| Natural science, theory of machinery, mechanical technology of the study of metals and motors | .. | 2 | 2 | 2 | 6 | 18.7 | .. | 2 | 2 | 2 | 6 | 15 |
| Workshop instruction | .. | .. | .. | .. | .. | ... | 2 | 2 | 3 | 3 | 10 | 25 |
| Total | 8 | 8 | 8 | 8 | 32 | 100 | 10 | 10 | 10 | 10 | 40 | 100 |

There are quite a number of continuation schools for girls in Austria. The Austrian report shows 1,055 industrial schools for women, with 32,968 pupils. A large portion of these are continuation schools. These schools give instruction in housekeeping, as well as the various industries followed by women in Austria. They are mostly erected by private local authorities, but are given some assistance by the State.

## Conclusion

My general impression of the Austrian continuation school is unfavorable. It does not seem to me to be as efficient as corresponding schools in Germany and Switzerland. There is one exception I must make to this statement. The technical continuation classes carried on in the State In-

dustrial Schools of Prague and Brunn were doing as fine work as I saw anywhere in Europe; in fact, they are model schools of this type, as they were intended to be.

The "Vorschulen" (preparatory schools), mentioned above, exist in considerable numbers in the cities. They are made necessary quite largely by the influx of country youth who often speak another language than the one in common use. In 1900, there were 14,000 of such pupils in Vienna. Their knowledge of reading, writing, and mathematics was defective, and many of them were unable to speak German. Before doing satisfactory work in a general continuation school, it is necessary for these students to review carefully the elementary subjects.

Teachers in the continuation schools of Austria, with the exception of those found in the industrial day schools, are usually elementary teachers. Some of these have received some special training for this work. As a rule, they are teachers whose main interest and employment are elsewhere. This is true even of the Directors. These two facts together constitute one of the most serious criticisms of the system. A further criticism is the apparent unwillingness of the Austrian employer to provide the apprentice with a moderate amount of daytime for his industrial education. The Ministry of Public Works is striving to secure a greater amount of day instruction; and in Vienna an enormous building, which will care for 10,000 apprentices, is being constructed for continuation school purposes alone. This, of course, will be used at all hours of the day. A final criticism is the one mentioned at the beginning of the chapter: the lack of intimate connection between the associations and guilds and the various industrial continuation schools conducted by the state.

The students completing the State industrial schools are, of course, freed from the obligation of learning a trade in a master's shop. As has been stated, the same thing is true of a large number of the special schools for individual industries. Those completing the building-trades schools

and art-trades schools have the same privilege. Those completing the apprentice shop instruction will be prepared for entrance into the industries.

Graduates of the State Industrial Schools and many of the special government schools are, however, not likely to enter the ranks as skilled workmen. They will aspire to administrative positions. Statistics furnished in this report show that the great majority of the workmen obtain their training in the master's shop and the continuation school.

The Austrian officials, however, insist that while the trades can not usually be taught in a school, in these days of specialization they can not usually be taught in the workshop alone. As one Austrian puts it, "Trades can not be taught in a school, but trades can not be taught without a school." This, I think, expresses their point of view. They point out that when an apprentice's education is confined to a workshop, there is danger of his following the conventions of the workshop, and of learning no theory, no drawing, nothing of the value of materials or of the applicability of certain materials to certain work. By means of a skilful system of education, supplementing workshop practice, he is supplied with this information. He then has both the workshop practice for actual production of objects, and the school theory to provide him with industrial intelligence. It is urged, further, that in the school which attempts to teach the whole trade, the apprentice is employed only as an apprentice, and his orderly systematic training is the only aim; here his training will be more systematic than can be possible in an ordinary workshop; here he will have an efficient teacher who will carefully supervise his work; and here he will be preserved from many of the moral dangers surrounding workshop apprenticeship.

It is urged, on the other hand, that the business side of the industry — the intercourse with customers, the consideration of the needs of the trade, the habits of application and rapid work, the proper use of material, manual skill, and the careful consideration of the value of the product from a commercial point of view — can only be learned in appren-

ticeship. The Austrian authorities have carefully balanced the arguments on the two sides of the question, and take the position that apprenticeship in its present weakened form is not sufficient for the training of the apprentice, but that the school is not in a position to offer a complete substitute for the apprenticeship. Both the school and apprenticeship are required for the proper kind of industrial education. This means the further development of the technical continuation school.

## CHAPTER XX

# COMMERCIAL EDUCATION IN AUSTRIA

### INTRODUCTION

AUSTRIA has developed a system of commercial schools, including: first, commercial continuation schools with a three years' course for commercial apprentices; second, a one year's commercial course for boys and girls; third, a commercial school with a two years' commercial course for boys and girls; fourth, a commercial academy with a course of four years, including a two years' course for girls; fifth, a one year's course for graduates of the secondary schools; sixth, the Export Academy of the Imperial Austrian Commercial Museum, and the commercial colleges (Revoltella), at Trieste; seventh, lectures and courses for the training of candidates for positions as teachers in the higher commercial educational institutions.

These different types of commercial schools have been provided to care for the varying needs of persons engaged in special branches of commerce. The commercial instruction undertakes to suit itself as closely as possible to the special conditions of the country or territory in which the school is located. It attempts to provide both a general foundation in the technique of commerce and also the skill demanded in special situations. The courses of study, therefore, are as various as the needs for which they provide. The more specializing there is in commerce, the greater is the need for special information, for commercial instruction corresponding to the demands made upon the merchant.

The Austrian commercial schools of all sorts are provided with libraries for teachers and pupils, and with collections for instruction in economic geography and knowledge of wares and the scientific subjects. In connection with the

VIENNA COMMERCIAL ACADEMY

use of the collection practical exercises are introduced. Inspections of industrial and commercial plants, as well as excursions, form an important part of the training given. Every effort is made by means of these practical exercises to provide an instruction that will enable the student to make himself useful in the counting-room or shop at once.

The subjects of instruction are much the same as those in the schools of Germany, and the course of study shown in connection with the special institutions described in this report will give an idea of their character.

## Development of Commercial Institutions in Austria

The first commercial academy in Austria was founded in Vienna in 1770 by John George Wolf, formerly professor of mathematics in the University of Strassburg. The course at first was one year in length, but was quickly increased to two. The results were striking, and the school continued to exercise a great influence in Austria until the death of the founder in 1796. This success led to the introduction of commercial instruction in other institutions, and also to some opposition on the part of the clericals, who generally controlled the secondary schools. In 1804, the commercial academy was changed into a Realschule. In the new charter it was provided that the director must be a clergyman. The school became a general educational institution, including a commercial department — much like other Realschulen which included an industrial department. Like other institutions having a dual aim, its career as a commercial school was not as successful as was expected. The experience of both Germany and Austria in such institutions with dual aims has been rather discouraging.

During the first half of the nineteenth century, a large number of private commercial schools arose and commercial continuation schools were established by commercial organizations in the larger cities of Austria. Many of these are

still in existence, although they are now under State inspection, and receive considerable assistance from State funds.

During the years following the death of Wolf, many of the commercial classes of Austria sent their sons abroad for preparation in commercial lines. After the founding of the Commercial Institute in Leipsic, many of them attended this school. About the middle of the century, the protest against this practice led to the founding of a number of commercial academies; the first one being in Prague in 1856, the second in Vienna in 1857, the third in Gratz in 1863. It is interesting to note that the one in Prague was founded by one of the pupils of Shiebe, the first director of the Commercial Institute of Leipsic. It is also interesting to note that he was a Strasburg man.

These three academies could hardly be classed as general public schools, as they were founded by the people interested for special purposes. No two of them were alike in their plans of work. They are all still in existence; the one in Vienna occupying a magnificent building, and having a large attendance.

Increasing demands led later to the founding of the Export Academy in Vienna, which may be compared with the commercial colleges of Germany, although neither this school nor the one in Trieste is, strictly speaking, a commercial college.

In 1905, a new commercial academy was founded in Vienna by the Commercial Club of that city, an organization which dates back to 1870.

In an address given in March, 1908, at the opening of the school in its new building, Herr Popper, President of the Board of Trustees and Vice-President of the Commercial Club, made the following statement: "Our Club counts it a privilege and a duty to devote itself to the spreading of education among those in business. It has concentrated upon giving opportunity for technical and general instruction. Three decades ago we began establishing special courses offering to people in business the opportunity to

LABORATORY IN VIENNA COMMERCIAL ACADEMY

extend their knowledge. Over 30,000 students have taken part in these courses.

"In 1894, we founded the two-year course in commerce. As this school was a decided success, we thought it time to found a more advanced school.

"For a number of years, the public of our native city has demanded a second commercial academy, established and supported by the Government. We did not believe that we should — or could — wait for that.

"In the year 1905, we founded the new Vienna Academy of Commerce, and the large attendance has forced us to construct this building which we open to-day."

### Educational Institutions of the Vienna Commercial Club

In 1910, the following courses were offered by the Academy:

1. Two-year general course, including the preparatory course; very rapid and practical.

2. The Commercial Academy proper. Four years' course. Takes students who have finished four years of a Gymnasium, Realgymnasium, or Realschule, or three years of a Bürgerschule. This means that pupils must have completed a course of eight years in the elementary school. Gives a well-rounded commercial technical training and general education.

3. Graduate course. One year. Fits graduates of Gymnasium, Realgymnasium, or Realschulen to enter industrial or mercantile careers. It gives those intending to be lawyers or engineers a deeper insight into trade and manufacturing.

4. Two-years commercial course for girls. Fits capable girls for office work, thorough education in commercial branches, German, French, English, geography, and stenography. Requires three years of Bürgerschule.

5. One-year special course for girls and women.

Makes students competent to look after the books, correspondence, and office work. Takes students who have finished their compulsory education.

6. Course for students who have the certificate of one year's voluntary military service or who have completed six years of a secondary school.

7. Special course in bookkeeping, commercial arithmetic, business correspondence, French, English, Italian, Hungarian, Slavic languages, stenography, penmanship, railroads, tariff, etc.

8. Course in commercial technique. One year.

9. Technical course in commerce for graduates of girls' lyceums. One year. Forenoons only. Fits to enter mercantile or manufacturing business by an extensive survey of the field of trade.

The subjects in the course of study of the new Vienna Commercial Academy, which are by no means common in our country, are:

1. Political arithmetic, the calculation of annuities of all sorts, interest on investments, discounts, the mathematics of state lotteries, expectation of life, probabilities, insurance of capital, reversions, widows' pensions, insurance calculations.

2. Study of zoölogy, mineralogy, and botany from the point of view of products.

3. Study of raw materials, partly finished, and finished products. Chemical and mechanical processes in manufacture. Metals, abrasive materials, ornamental stones. Flours, starches, sugar, drugs, rubber, dyes, leathers, paper.

4. Means of business. Study in detail of systems of transportation and communication. Banking, exchange, clearing, etc. Fairs, markets, auctions, warehousing, chambers of commerce, mercantile associations, treaties, consuls, etc.

This school was founded in 1905. Attendance has steadily increased, as follows: 1906, 466; (New building, 1908); 1909, 1,014; 1910, 1,181.

Inspection of the list of graduates shows that the boys are either with commercial houses or in the army. Of the girls, a fair proportion are listed as "at home."

Students come from other places to attend this school, though Vienna furnishes most in the four-year course.

PROGRAM OF FIRST COURSE OFFERED BY THE ACADEMY—PREPARATORY YEAR

| | Number of Hours | | |
|---|---|---|---|
| Compulsory Studies | Preparatory Class | I Class | II Class |
| Religion | 2 | .. | .. |
| Languages | 5 | 4 | 3 |
| Arithmetic | 5 | 4 | 4 |
| Commercial correspondence and office work | .. | 3 | 4 |
| Bookkeeping | .. | 3 | 4 |
| Commerce and exchange | .. | 3 | 4 |
| Geography | 3 | 3 | 3 |
| Natural history | 5 | .. | .. |
| Natural science | 4 | .. | .. |
| Study of wares | .. | 3 | 3 |
| Penmanship | 3 | 3 | 1 |
| Stenography | .. | 2 | 2 |
| French or English | .. | 6 | 6 |
| | 27 | 34 | 34 |
| Optional Subjects | | | |
| Gymnastics | 2 | 2 | 2 |
| Typewriting | .. | .. | 2 |

SECOND COURSE OFFERED—GENERAL COURSE

| Compulsory Studies | I Class | II Class | III Class | IV Class |
|---|---|---|---|---|
| German language | 4 | 3 | 3 | 2 |
| French language and correspondence | 4 | 4 | 4 | 4 |
| English language and correspondence | .. | 4 | 5 | 5 |
| Commerce and commercial geography | 2 | 2 | 2 | 2 |
| General and commercial history | 2 | 2 | 2 | 2 |
| Mathematics — | | | | |
| (*a*) Algebra and political arithmetic | 2 | 2 | 2 | 2 |
| (*b*) Geometry | 2 | .. | .. | .. |
| (*c*) Commercial arithmetic | 3 | 3 | 3 | 3 |
| Natural history | 3 | .. | .. | .. |
| Physics | 4 | .. | .. | .. |
| Chemistry and chemical technology | .. | 2 | 2 | .. |
| Study of wares and mechanical technology | .. | .. | 2 | 2 |
| Science of commerce | 2 | 2 | .. | .. |
| Commercial correspondence | .. | 2 | 3 | 2 |
| Bookkeeping | .. | 2 | 3 | 4 |
| Counting-room work | .. | .. | .. | 6 |
| Calculation of exchange | .. | .. | 1 | .. |
| Commercial and industrial arithmetic | .. | .. | .. | 2 |
| Political economy | .. | .... | | 2 |
| Penmanship | 2 | 2 | .. | .. |
| Stenography | 2 | 2 | .. | .. |
| | 32 | 32 | 32 | 32 |

| Optional Subjects | | | | |
|---|---|---|---|---|
| Italian and correspondence | .. | 3 | 3 | 3 |
| Exercises in analytical chemistry | .. | .. | 2 | 2 |
| Practical exercises in the study of wares | .. | .. | 2 | 2 |
| Gymnastics | 2 | 2 | 2 | 2 |
| Typewriting | .. | .. | .. | 2 |

## THIRD COURSE OFFERED — GRADUATE COURSE FOR BOYS IN THE ACADEMY

| Compulsory Studies | Hours |
|---|---|
| Commercial arithmetic | 4 |
| Office work and correspondence | 2 |
| Bookkeeping and counting-room work | 4 |
| Commerce and theory of exchange | 3 |
| Commercial geography and statistics | 2 |
| Political economy | 3 |
| The important industries | 2 |
| Political arithmetic | 2 |
| | 22 |

Optional Studies

French, English, stenography, penmanship

## FOURTH COURSE OFFERED — TWO YEARS COMMERCIAL COURSE FOR GIRLS

| Compulsory Studies | Number of Hours I Class | II Class |
|---|---|---|
| German | 2 | 2 |
| French or English | 6 | 6 |
| Commercial arithmetic | 4 | 3 |
| Commerce and theory of exchange, first semester | 3 | 2 |
| Single-entry bookkeeping, second semester | 3 | . |
| Double-entry bookkeeping | .. | 4 |
| Correspondence and office work | 3 | 2 |
| Commercial geography | 2 | 2 |
| Stenography | 2 | 2 |
| Penmanship | 2 | 1 |
| | 24 | 24 |

| Optional Studies | | |
|---|---|---|
| Gymnastics | 2 | 2 |
| Typewriting | .. | 2 |

## SIXTH COURSE OFFERED — COURSE FOR BOTH SEXES

| Compulsory Studies | Hours |
|---|---|
| Commercial arithmetic | 5 |
| Correspondence and office work | 2 |
| Bookkeeping | 5 |
| Commerce and theory of exchange | 3 |
| Commerce, exchange, and industrial arithmetic | 2 |
| Civics | 1 |
| Commercial geography and statistics | 2 |
| Study of wares | 2 |
| | 22 |

| Optional Studies | |
|---|---|
| Stenography | 2 |
| | 24 |

## SEVENTH COURSE OFFERED

| Compulsory Studies | Hours |
|---|---|
| German | 2 |
| Commercial arithmetic | 4 |
| Commerce and theory of exchange | 1 |
| Bookkeeping | 4 |
| Correspondence and office work | 2 |
| Commercial geography | 2 |
| Stenography | 2 |
| Penmanship | 2 |
| | 19 |

| Optional Studies | |
|---|---|
| French | 3 |
| English | 3 |
| Gymnastics | 2 |
| Typewriting | 2 |

## NINTH COURSE OFFERED — COURSE FOR GRADUATES OF LYCEUM FOR GIRLS

| Compulsory Studies | Hours |
|---|---|
| Commercial arithmetic | 5 |
| Correspondence and office work | 3 |
| Bookkeeping | 5 |
| Commerce and theory of exchange | 2 |
| Commerce, exchange, and industrial arithmetic | 2 |
| Commercial geography and statistics | 2 |
| Study of wares | 2 |
| Political economy | 2 |
| Civics | 1 |
| | 24 |

| Optional Studies | |
|---|---|
| Stenography | 2 |
| Penmanship | 2 |
| Typewriting | 2 |
| | 30 |

## CHAPTER XXI

# INDUSTRIAL EDUCATION IN SWITZERLAND

IT is not an easy task to compress into a brief article a sketch of the Swiss educational system, industrial or otherwise. Education is a matter for the cantons, and there are twenty-five of these in Switzerland; some of them German, some of them French, some of them Italian; some of them Catholic, some of them Protestant; some of them country districts, some of them towns; some whose main interest is dairying and agriculture, some watch-making, and some caring for the tourists. Each one of these small divisions acts in accordance with its ideals and with its interests. The result is a situation not easily understood by the stranger.

One thing, however, is noticeable. Great attention is paid in most of the cantons to the public school system, and in later years to the industrial school system. In Switzerland the masses decide almost every law by ballot. The adequate education of the masses is therefore a most urgent question. This feeling is made evident by the length of the compulsory period of education, some of the cantons having as many as nine years of compulsory instruction. The Swiss also show their esteem for education by the compulsory preliminary courses for army recruits. Every raw recruit — unless he can show evidence of education beyond that given in the elementary school — must take a compulsory preliminary course, concluding with an examination. These examinations have produced a rivalry among the cantons that has greatly stimulated the development of supplementary and continuation schools.

As has been stated, several of the cantons require attendance until the pupils are in their sixteenth year. The school year is usually forty weeks long, with thirty-one

periods of instruction per week in the upper grades, and twenty-six periods in the lower. In cantons with shorter compulsory periods in the elementary school we usually find compulsory supplementary courses which generally demand fewer hours per week. Manual training for both boys and girls is found almost everywhere in the elementary schools. In a survey of Swiss education, Dr. Kerschensteiner declares that there are four things of great significance for vocational training in the Swiss elementary schools:

1. While elementary education in the best cantons is not greater in quantity than that given in most German States, it keeps a hold on the youth from the thirteenth to the fifteenth year, when training in character begins to follow definite lines.

2. In this way, the beginning of apprenticeship is postponed, and the boy is protected, until he reaches years of discretion, from the influences of bad company and the rougher sorts of laboring men.

3. In many cantons the higher classes of the elementary school, or of the finishing school supplementing the elementary school, have a vocational character.

4. Not only has maturity of body and mind become greater during this lengthened school period, but training of the hand has been given by the Swiss schools during the entire course of instruction. There are what they call "Froebel classes" for pupils in the lower primary grades. In many of the normal schools of the country, instruction in manual training is compulsory. In some of the rural secondary schools you will find systematic instruction in agriculture (gardening), as well as manual training.

All cantons, without exception, have continuation schools. These continuation schools are usually winter courses with three to six periods a week. They teach languages, arithmetic, writing, and national history. These continuation schools bear different names in different cantons; such as evening review schools, preliminary courses for recruits, supplementary schools, etc.

The continuation schools are compulsory in cantons with shorter periods of compulsory education.

The tables at the end of this chapter will show the situation in 1908.

Many of the secondary schools have the ordinary academic, technical, and commercial departments. These schools seem to be similar in character to the schools described in Germany as "Realschulen." Every schoolmaster is inclined to emphasize the importance of carrying on all these lines of educational work under one general management. The disadvantages appear when the scheme is put in operation. In Switzerland you find all these lines jumbled together. In the vocational schools you find no trace of the wonderfully simple organization of the corresponding Austrian schools. If you know one school of a certain type in Austria, you know the rest; this is not the case in Switzerland.

Aside from the great polytechnic in Zurich, the higher technical schools are the so-called "Technika," of which there are three — at Winterthur, Burgdorf, and Biel. The author visited the ones in Winterthur and Biel. They are very much like the schools teaching the same subjects in Germany, and include quite a number of industrial schools under one director. In Biel, there is a clock-making institution with a three years' course; a course for electrical and mechanical engineers with a seven years' course; one for fine mechanics' work with a three years' course; a school of engraving with a four years' course; a school of architecture with a three years' course; and a school of railroading with a two years' course. Some of the departments have considerable shopwork; some very little. The school is a good one in every respect.

There are a number of art-trades schools which are doing excellent work. The one at Zurich has taken upon itself the shop and drawing instruction of apprentices in the art trades, the apprentices receiving their instruction in languages, mathematics, and other subjects in the ordinary evening continuation school. While the instruction in

shopwork and drawing is excellent, the separation of the other instruction from the vocational work and putting it in the hands of other school agencies seems unfortunate.

The continuation schools for apprentices were inferior as a whole to those in Germany. There is little practical shop instruction, except in the case of the art-trades apprentices, and in this case the practical instruction is separated from the academic work. The number of hours is not very great, and too large a proportion of the work is done in the evening under unfavorable circumstances. There is nothing of distinctive value in the Swiss continuation school system for one who is familiar with the German system.

The Swiss, however, offer a large number of trade and vocational schools which can not be classified, but which are worth seeing.

The schools in different cantons vary widely in their efficiency. They differ in the opportunities they offer to teachers. The salaries of teachers in some of the cantons are extremely low; so low that the teacher is compelled to gain a good part of his livelihood in some other occupation — perhaps as waiter in one of the big hotels in summer.

### Apprentice School at Bern

One of the most interesting industrial schools in Switzerland is the apprentice school at Bern. Dr. Kerschensteiner calls attention to this school in his report on the Swiss schools, written in 1900. He in turn had been directed to the school by an article in the Bavarian Journal of Art and Industry in 1898. The writer is indebted to this report for many of the details connected with the management of this school.

Dr. Kerschensteiner states that the unsatisfactory results of the instruction given by master-workmen to their apprentices, and the lack of really skilled artisans, led Architect Tieche to start a vigorous campaign for the establishment of an apprentice shop in Bern. He was at that time chairman of the committee on apprentice shops, government expert,

and inspector of the industrial schools in French Switzerland. As a result of his agitation, the council of Bern established an apprentice shop for cabinet-makers and shoemakers in some old barracks in the town. The prospects of success at first were very scanty. The masters disliked the shop; the shoemakers feared its competition; the quality of the students was poor. They were untrained and poorly prepared in every way.

Things took a turn for the better in 1891, when the first students graduating from the apprentice shops were examined by a committee of experts. Gradually a better class of students entered the shops. Entrance examinations were required. The best could be taken, and the defective rejected. In 1894, two new divisions were opened, one for mechanical engineers and one for tinners and plumbers. In December, 1910, arrangements were being made for adding another department, for tailors.

In 1895, the institution was moved into a new building, which had originally been built as a blind asylum. This building had many well-lighted rooms and excellent sanitary equipment. The school rapidly developed under these new conditions. At the National Exhibition in Geneva, 1906, the institution received much praise on account of its exhibit; and many doubted whether the work was really done by mere students. As a result, the officials of the Swiss Trade Unions were asked to have the cabinet-makers' apprentices thoroughly examined by experts. This was done. One of the best cabinet-makers was delegated to conduct the examination, which lasted three days. The report of the expert was:

"Everywhere I found everything systematic, and observed the diligence with which the boys worked; . . . everything is done as prescribed, and by the students themselves, so that I say to every artisan: 'if you go to Bern, visit the apprentice shops there; no one will ever regret having done so.' I wish that the number of poor fellows having to learn a trade under poor conditions had the good fortune to be in an apprentice shop such as these."

## Description of the Classes

Each of the four divisions has an expert leader, who supervises the shopwork, distributes the drawings, manages the departments, purchases the materials, and sells the products. In the shoemaking and sheet metal work instruction is also given in shops. Two of the ablest leaders were German; one had been trained in Stuttgart, and the other in the school at Karlsruhe. The shop teachers are master mechanics. The director of the school is a commercially-trained man; he gives instruction in technical arithmetic and bookkeeping, and manages the business side of the school, which is by no means an unimportant feature.

The boys must produce articles of commercial value from the first. The cabinet-making and shoemaking departments fill private orders almost exclusively; the other departments work partly for employers. The director told the writer that they managed to pay about half of the expenses of the school by the sale of the work of the students. When the writer visited the school, the plumbing department was in Grundewald, executing a contract there. The school has a boarding hall, wtih thirty-six boarders.

The instruction covers fifty-seven hours a week, from seven a. m. to six p. m., with a mid-day rest of one and a half hours. Forty-seven periods are devoted to shop, seven to drawing, and three to arithmetic, with industrial bookkeeping. This seems like an enormous amount of shopwork, but the proportion corresponds favorably with the proportion seen in places where the instruction of the apprentices is divided between the masters' shops and the continuation school. The boy gets ten hours a week of instruction to supplement the forty-seven in the shop. He receives, after a little preparatory interval, a small remuneration for the work he executes. It is claimed that the boys leaving Bern's apprentice shops are less speedy than those who have been trained in the actual industry, but that they are much more versatile and eventually make better workmen.

Only in the theoretical branches are the students divided

into grades. In the shop each division contains students from each of the three years, with a master. This stimulates competition, enables the young to learn from the older, and reproduces the conditions of real shop life. The course is finished in three, or at the most in four, years, when the students passing an examination are given a diploma.

The instruction in arithmetic and bookkeeping begins with simple industrial accounts, and this with practical examples forms the main work of the first year; in the second year cost-estimates are studied with immediate reference to the purchase of materials used in the four trades represented in the school. Later, considerable emphasis is given to estimates of cost of production for which an extremely practical foundation is provided in the shop drawings. Every student has a blue print of these, from which he makes his estimates, which he may keep and incorporate in his portfolios for future reference. Bidding, carried on in a practical way, constitutes an important exercise. A complete sectional plan of a building is placed in the students' hands. The teacher writes out the specifications for the competition among the students, who have to submit bids. In the third year, accounting is dealt with very carefully. Calculation of surfaces and volumes is studied.

Dr. Kerschensteiner's account of the work in drawing of the cabinet-makers will be of interest.

"The course begins in the first year with projection of right angles, pyramids, simple profiles, cones, elevations, and shoulder pieces. These exercises are taken up in geometric as well as in isometric projection from fine models, upon the backs of which the geometric projection was sketched whenever possible to help the student to a quicker understanding of it. Applications to consoles, pilasters, pillars, columns, and diagonal panels were given with every theoretical exercise. Combined with these more introductory exercises was the immediate undertaking in the shop of the practice work, which the proficient had prepared in the meantime, or were on the point of getting ready: kitchen chairs, corner pieces for glass doors, tabourets, kitchen tables, door corner

pieces, estimates for doors. Exercises in freehand drawing run through the year.

"The same procedure is followed in the second year. Whatever is made in the shop is first drawn on the scale of one to five, then detailed full size; washstands, bedsteads, wardrobes—in short, the simpler articles of furniture. From the individual drawing, details were immediately drawn off full size, finished, and intelligently put together for a drawing of an article of furniture. This drawing was sketched one-fifth size and the teacher made blue prints of it. After the blue print and the detail drawings, the work was executed by the student in the shop. Freehand drawing taken at the same time has to do with cabinet-making. Toward the end of the year wood-mosaics after studies of nature are made by the better students.

"Not till the third year does the sketching of furniture become most important. Special sketching portfolios are kept for this purpose. Also light and shade (but only after models, as is also right for this school) and the forms of architecture are taught, not to every student, but only to the more gifted. The sketching of furniture in free perspective was not a task that the boys enjoyed, as it seemed, for the portfolios were not very full. At any rate, I observed (master and teacher confirmed it) that the boys come to all the freehand work with but little pleasure. This dislike increases in passing from cabinet-makers to locksmiths, from these to the plumbers, and reaches a climax with the shoemakers.

"The drawing courses of the other departments are similar in character. Four big rooms — among them three large halls in the main building — fifty meters long altogether, are used for cabinet-making. The fourth room in an adjoining building is equipped with four horse-power gas engines and with power and speed-lathes. When I was there the first year boys were busy with tasks in sawing, chiseling, putting on zinc, and planing pine. I also saw this last work done by older boys, though with hardwood, since almost all the training is in this material, to give the

desired accuracy and skill. In the first year the boys are allowed to make foot-stools, tabourets, etc., along with their other tasks, for the satisfaction of it. By the end of the first year the boys are supposed to be able to make little pine tables without help. Older boys were busy making oak beds, and a larger group of boys were working on an interior in Tyrolese Gothic. Some boys skilled in drawing had decorative tasks to execute — burnt wood and mosaics, the latter in part after their own designs, partly after the designs of the well-known mosaic firm, Spindlers of Stuttgart. Model clockcases for the clock trade were being made on an order from the Bern Museum of Industry. The designs for all work that I saw were those of the head of the department."

Dr. Kerschensteiner had unusual opportunities for examining the question of the effect of selling articles produced in the shop. This is a burning question wherever there are apprentice shops — at Augsburg, Fürth, Winterthur, and some Austrian schools. On the one hand, there are pedagogical and economical advantages in producing directly for the trade; on the other hand, this seems to produce unfair competition which is complained of by the workmen. I will submit Dr. Kerschensteiner's discussion of this question, with the purpose of giving the European point of view:

"Goods are sold from the shops. That is the purpose of the work, and the income thus secured is a considerable item in the budget. There is a large number of apprentice schools that refuse to sell goods, and confine themselves solely to making single parts. The question of which policy to pursue must be looked at from various points of view — from the pedagogical and the financial, for this institution as well as for the other industrial schools of the country, and from the economic point of view of the men in the trades, as well as of the laborers who have settled in the town where the apprentice school is located. As for the pedagogical side, one will readily admit that shops which are to teach a trade thoroughly cannot get along without making finished

articles. If the apprentice seeks work after graduation as a journeymen, he must be competent, and it does not help his employer if he must first learn to combine parts accurately. It is in this very assembling that there is the best training in accurate work. Only the completed work shows whether the proportions are tasteful and harmonious; an article of furniture, though well thought out in detail, may give a bad impression as a whole. Above all, one should not overlook the great educational effect on the apprentice of preparing real things to be used, and not things about which they know from the start that they will be stored for eternity in garrets and lumber-rooms. To be sure, in most countries the apprentice shops which make parts and not the completed articles dispose of their product in an easy way to the continuation schools, which they thus equip gradually with excellent models for special drawings, and in such schools there results a cumulative beneficial effect, for the poverty of our continuation schools in such models is lamentable. But in this particular, the time will come when this need will be satisfied. The financial side in relation to the school fully justifies the sale of products, for the apprentice schools cannot help being expensive. If such useful, nay even indispensable, schools can support themselves, even to a small extent, the establishment of others will be easier, especially in Germany, where a beginning is yet to be made.

"The answer now seems different when we view the general economic side; for the question immediately rises whether there is much competition with the masters. In reality, the fear of this competition everywhere was one of the reasons why the masters at first opposed apprentice schools. In case apprentice schools in the same trade should be started in a larger town, such as Bern, in great numbers, this fear might not prove groundless. But such an occurrence is impossible from the very nature of the case. For, as I think, apprentice shops ought not to exist to displace masters altogether, but to educate further a small but preeminently competent part of the workmen and especially

to attract intelligent children of the better families back to the handicrafts again. And this latter will be all the surer to happen if there is at hand an apprentice shop to which a child can be entrusted with assurance against moral dangers and confidence of receiving a fundamental, comprehensive training. Apprentice shops in the larger towns are in a position to exclude all incompetent elements and they would hinder their own progress if they were compelled to give up this policy by reason of there being too many of them, or if by crowding the trades they put the individual to too hard a test in the struggle for existence. So I recommend that only a few — perhaps one for each trade — be established in a town. In the case of Bern, experience has

COMPULSORY ATTENDANCE AT AN ELEMENTARY SCHOOL (WITHOUT OBLIGATORY CONTINUATION SCHOOL)

| Cantons | Beginning of School | Minimum Age on Entering School | Number of School Years | | Minimum Age at Leaving the All-Day School | Minimum Age at Leaving the Supplementary School |
|---|---|---|---|---|---|---|
| | | | All-Day School | Supplementary School | | |
| Zurich | May | 6 | 8 | .. | 14 | .. |
| Bern | May | 6 1/12 | 8–9 | .. | 14 1/12 | .. |
| Lucerne | May | 6 3/4 | 6 | 2 | 12 3/4 | 14 3/4 |
| Uri | Oct. | 6 3/4 | 6–7 | 2 | 13 | 15 |
| Schwyz | May | 6 1/2 | 7 | .. | 13 1/2 | .. |
| Obwalden | May | 7 1/12 | 6–7 | 2 | 13 1/12 | 15 1/12 |
| Nidwalden | May | 6 1/2 | 7 | .. | 13 1/2 | .. |
| Glarus | May | 6 | 7 | 2 | 13 | 15 |
| Zug | May | 6 1/2 | 7 | .. | 13 1/2 | .. |
| Freiburg | May | 6 1/2 | (8) 9 | .. | (14 1/2) 15 1/2 | .. |
| Solothurn | May | 6 1/2 | (7) 8 | .. | (13 1/2) 14 1/2 | .. |
| Basel City | May | 6 | 8 | .. | 14 | .. |
| Basel Province | May | 6 | 6 | 3 | 12 | 15 |
| Schaffhausen | April | 6 | 8 | 0 or 1 | 14 | 15 |
| Appenzell A. Rh. | May | 6 | 7 | 2 | 13 | 15 |
| Appenzell I. Rh. | May | 6 1/2 | 7 | (3) | 13 1/2 | .. |
| St. Gall | May | 6 | 7 | 2 | 13 | 15 |
| Graubünden | Oct. | 6 3/4 | 8 | .. | 14 1/4 | .. |
| Aargau | May | 6 1/2 | 8 | .. | 14 1/2 | .. |
| Thurgau | April | 6 | (8) 9 | .. | (14) 15 | .. |
| Tessin | Oct. | 6 | 8 | .. | 14 | .. |
| Waadt | April | 6 1/2 | 8 or 9 | .. | 14 1/2 | .. |
| Wallis | Oct. | 6 3/4 | 8 | .. | 14 3/4 | .. |
| Neuenburg | May | 5 5/6 | 8 | .. | 14 | .. |
| Geneva | Sept. | 7 | 6 | 2 | 13 | 15 |

shown that there is no real competition and that the masters are at present friendly to the school. They have some of their orders filled by the school. Even the workingmen, except the journeymen tinners, unanimously pronounced for the school in a Socialist gathering which was held when I was in Bern, and took up the question of apprentice schools. One must assume that the school does not do work at a lower price than the masters and so fix its own wages and prices. The net profits, so useful to the school, are trifling for the individual masters of industry in a big town. At the very most, the proceeds from products of the apprentice school might be used for the guild of the proper trade or for a co-operative store for the same purpose."

The writer visited similar apprentice shops at Augsburg,

THE ORGANIZATION OF THE GENERAL CONTINUATION SCHOOLS AND THE PREPARATORY COURSE FOR RECRUITS.

| Cantons | Continuation Schools | | | Age of the Pupil | Recruits' Preparatory Course | |
|---|---|---|---|---|---|---|
| | Obligatory or Voluntary | No. of Years or Winter Courses | Minimum No. of Hours per Course | | Obligatory or Voluntary | Number of Courses and Hours |
| Zurich | Vol. | 1–3 | .. | from 15 on | .... | ..... |
| Bern | Obli. | 2 | 60 | 15–18 | Vol. | ..... |
| Lucerne | .... | .. | .. | .... | Obli. | 2 C. of 40 hrs. |
| Uri | Obli. | 3 | 40 | 16–19 | Obli. | 1 C. of 20 hrs. |
| Schwyz | Vol. | .. | .. | from 14 on | Obli. | 2 C. of 40 hrs. |
| Obwalden | .... | .. | .. | .... | Obli. | 1 C. of 40 hrs. |
| Nidwalden | .... | .. | .. | .... | Obli. | 1 C. of 90 hrs. |
| Glarus | Vol. | .. | about 80 | .... | .... | ..... |
| Zug | Obli. | 2 | about 60 | 17–19 | Obli. | 3 days |
| Freiburg | Obli. | 3 | 70 | 16–19 | Obli. | about 20 hrs. |
| Solothurn | Obli. | 3 | 80 | 15–18 | Obli. | 1 C. of 36 hrs. |
| Basel City | Vol. | .. | .. | .... | Vol. | ..... |
| Basel Province | Obli. | 2 | about 70 | 17–18 | Vol. | 12 hours |
| Schaffhausen | Obli. | 2 | about 50 | 17–18 | .... | ..... |
| Appenzell A. Rh. | Obli. | 2–3 | 60 | 16–18 | .... | ..... |
| Appenzell I. Rh. | Obli. | 3 | 80 | 15–16 | Obli. | 80 |
| St. Gall | Obli. | 2–3 | 80 | 16–19 | .... | ..... |
| Graubünden | Obli. | 2–3 | 90 | 16–18 | .... | ..... |
| Aargau | Obli. | 3 | 80 | 16–19 | .... | ..... |
| Thurgau | Obli. | 3 | 50–60 | 15–18 | .... | ..... |
| Tessin | Obli. | 3–4 | 60 | 15–18 | Obli. | 12 D. of 4 hrs. |
| Waadt | Obli. | 3–4 | 60 | 15–19 | Obli. | 24 hours |
| Wallis | Obli. | 4 | 120 | 15–19 | Obli. | 50 hours |
| Neuenburg | Obli. | 2 | 64 | 17–18 | Obli. | 24 hours |
| Geneva | Vol. | .. | .. | .... | Obli. | 36 hours |

Fürth (Germany), and Winterthur (Switzerland). These are much alike, usually turning out good work from the mechanical point of view, having the same sort of difficulties, and apparently at a standstill, so far as growth and development are concerned. Everywhere the question of sale of products makes trouble. Everywhere the school authorities insist this is an essential part of the scheme. Such institutions alone do not seem to offer a practicable solution of this problem of industrial education.

### A. GENERAL CONTINUATION SCHOOLS AND PREPARATORY SCHOOLS FOR RECRUITS

| Cantons | General Continuation Schools | | | | | | | | Prep. School for Recruits | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obligatory | | | | Voluntary | | | | Obligat'y | | Volunt'ry | |
| | School | Boys | Girls | Total | School | Boys | Girls | Total | Course | Pupils | Course | Pupils |
| Zurich | .... | .... | .. | .... | 73 | 1094 | .... | 1094 | ... | ... | ... | .... |
| Bern | 560 | 8959 | ... | 8959 | ... | .... | .... | .... | ... | .... | ... | .... |
| Lucerne | .... | .... | ... | .... | ... | .... | .... | .... | ... | 1784 | ... | .... |
| Uri | 26 | 374 | ... | 374 | ... | .... | .... | .... | ... | 117 | ... | .... |
| Schwyz | .... | .... | ... | .... | ... | .... | .... | .... | ... | 798 | ... | .... |
| Obwalden | .... | .... | ... | .... | ... | .... | .... | .... | ... | 148 | ... | .... |
| Nidwalden | .... | .... | ... | .... | ... | .... | .... | .... | ... | 100 | ... | .... |
| Glarus | .... | .... | ... | .... | 18 | 249 | .... | 249 | ... | .... | ... | .... |
| Zug | 23 | 272 | ... | 272 | ... | .... | .... | .... | ... | 246 | ... | .... |
| Freiburg | 301 | 3948 | ... | 3948 | ... | .... | .... | .... | ... | 1081 | ... | .... |
| Solothurn | 101 | 2065 | ... | 2065 | ... | .... | .... | .... | ... | .... | 103 | 700 |
| Basel City | .... | .... | ... | .... | 1 | 219 | 555 | 774 | ... | .... | 4 | 78 |
| Basel Province | 71 | 1196 | ... | 1196 | ... | .... | .... | .... | ... | .... | 65 | 502 |
| Schaffhausen | 36 | 284 | ... | 284 | ... | .... | .... | .... | ... | .... | ... | .... |
| Appenzell A. Rh. | 82 | 771 | ... | 771 | ... | .... | .... | .... | ... | .... | ... | .... |
| Appenzell I. Rh. | 15 | 342 | ... | 342 | ... | .... | .... | .... | ... | .... | ... | .... |
| St. Gall | 92 | 1485 | 94 | 1579 | 139 | 728 | 1221 | 1949 | ... | .... | ... | .... |
| Graubünden | 20 | 225 | ... | 225 | 3 | 25 | .... | 25 | ... | .... | ... | .... |
| Aargau | 229 | 4657 | ... | 4657 | ... | .... | .... | .... | ... | .... | ... | .... |
| Thurgau | 135 | 2516 | ... | 2516 | ... | .... | .... | .... | ... | .... | ... | .... |
| Tessin | 155 | 2810 | ... | 2810 | ... | .... | .... | .... | ... | 619 | ... | .... |
| Waadt | 421 | 5010 | ... | 5010 | ... | .... | .... | .... | 202 | 955 | ... | .... |
| Wallis | 203 | 3208 | ... | 3208 | ... | .... | .... | .... | ... | 993 | ... | .... |
| Neuenburg | .... | .... | ... | .... | 3 | 290 | 150 | 440 | 72 | 1100 | ... | .... |
| Geneva | .... | .... | ... | .... | ... | 585 | 280 | 865 | ... | 377 | ... | .... |
| 1908 | 2470 | 38122 | 94 | 38216 | 237 | 3190 | 2206 | 5396 | 274 | 8318 | 172 | 1280 |

## B. INDUSTRIAL CONTINUATION SCHOOLS, INCLUDING CONTINUATION SCHOOLS FOR DRAWING

| Cantons | Schools | Boys | Girls | Total |
|---|---|---|---|---|
| Zurich | 38 | 4,670 | 2,006 | 6,676 |
| Bern | 51 | 2,657 | 372 | 3,029 |
| Lucerne | 7 | 654 | 52 | 706 |
| Uri | 1 | 70 | 33 | 103 |
| Schwyz | 14 | 486 | 259 | 745 |
| Obwalden | 4 | 36 | 27 | 63 |
| Nidwalden | 3 | 361 | ... | 361 |
| Glarus | 8 | 417 | ... | 417 |
| Zug | 5 | 189 | 65 | 254 |
| Freiburg | 12 | 560 | ... | 560 |
| Solothurn | 17 | 1,005 | ... | 1,005 |
| Basel city | .. | see industrial schools | | ... |
| Basel Province | 7 | 386 | 2 | 388 |
| Schaffhausen | 6 | 537 | 8 | 545 |
| Appenzell A. Rh. | 12 | 361 | ... | 361 |
| Appenzell I. Rh. | 3 | 30 | ... | 30 |
| St. Gall | 32 | 3,141 | ... | 3,141 |
| Graubünden | 10 | 665 | 91 | 756 |
| Aargau | 20 | 1,593 | ... | 1,593 |
| Thurgau | 15 | 496 | ... | 496 |
| Tessin | 25 | 984 | ... | 984 |
| Waadt | 26 | ... | ... | ... |
| Wallis | 7 | ... | ... | ... |
| Neuenburg | 4 | 220 | 80 | 300 |
| Geneva | 1 | 566 | 1,834 | 2,200 |
| 1908 | 328 | 19,884 | 4,829 | 24,713 |

## C. COMMERCIAL CONTINUATION SCHOOLS

| Cantons | Schools | Boys | Girls | Total |
|---|---|---|---|---|
| Zurich | 9 | 1,642 | 72 | 1,714 |
| Bern | 15 | 743 | 326 | 1,069 |
| Lucerne | 3 | 473 | 130 | 603 |
| Uri | .. | .... | .... | .... |
| Schwyz | 1 | 10 | .... | 10 |
| Obwalden | .. | .... | .... | .... |
| Nidwalden | .. | .... | .... | .... |
| Glarus | 1 | 68 | .... | 68 |
| Zug | 1 | 45 | 10 | 55 |
| Freiburg | 2 | 57 | 18 | 75 |
| Solothurn | 3 | 132 | .... | 132 |
| Basel City | 2 | 814 | 6 | 820 |
| Basel Province | 1 | 48 | 6 | 54 |
| Schaffhausen | 1 | 138 | 49 | 187 |
| Appenzell A. Rh. | 2 | 439 | .... | 439 |
| Appenzell I. Rh. | .. | .... | .... | .... |
| St. Gall | 13 | 2,482 | 487 | 2,969 |
| Graubünden | 3 | 157 | 144 | 301 |
| Aargau | 8 | 541 | .... | 541 |
| Thurgau | 7 | 341 | 13 | 354 |
| Tessin | 4 | 327 | 145 | 472 |
| Waadt | 12 | 1,484 | 575 | 2,059 |
| Wallis | 2 | 116 | 29 | 145 |
| Neuenburg | 4 | 549 | 77 | 626 |
| Geneva | 1 | 375 | 108 | 483 |
| 1908 | 95 | 10,981 | 2,195 | 13,176 |

## D. AGRICULTURAL CONTINUATION SCHOOLS

| Cantons | Schools | Boys | Girls | Total |
|---|---|---|---|---|
| Lucerne | 2 | 29 | .... | 29 |
| Nidwalden | 2 | 35 | .... | 35 |
| Solothurn | 5 | 101 | .... | 101 |
| Tessin | 1 | 19 | .... | 19 |
| Geneva | 1 | 37 | .... | 37 |

## E. HOUSEKEEPING CONTINUATION SCHOOLS AND COURSES

| Cantons | Schools | Girls | Courses | Participant |
|---|---|---|---|---|
| Zurich | 117 | 3,861 | .... | .... |
| Bern | 28 | .... | .... | 1,442 |
| Lucerne | 7 | 933 | .... | .... |
| Uri | 1 | .... | .... | .... |
| Schwyz | 1 | 32 | .... | .... |
| Obwalden | 1 | 14 | 1 | 22 |
| Nidwalden | 1 | 77 | 1 | 23 |
| Glarus | 24 | 711 | 8 | 136 |
| Zug | 3 | .... | .... | .... |
| Freiburg | 33 | 1,183 | .... | .... |
| Solothurn | 11 | 580 | .... | .... |
| Basel City | see women's work school | | | |
| Basel Province | 18 | 1,139 | .... | .... |
| Schaffhausen | 11 | 608 | .... | .... |
| Appenzell A. Rh. | 25 | 929 | 1 | 22 |
| Appenzell I. Rh. | 2 | 96 | .... | .... |
| St. Gall | 73 | .... | .... | .... |
| Graubünden | 13 | 126 | .... | .... |
| Aargau | 26 | 608 | 11 | 148 |
| Thurgau | 55 | 1,199 | .... | .... |
| Tessin | .. | .... | 3 | 37 |
| Waadt | 21 | .... | .... | .... |
| Wallis | 25 | 608 | .... | .... |
| Neuenburg | see vocational school | | | |
| Geneva | see vocational school | | | |
| 1908 | 496 | 12,704 | .... | .... |

## CHAPTER XXII

# CONCLUSION

IT is sometimes contended that the responsibility of the public for the education of the masses ends with the elementary school. Those destined for the professions, the executive positions, and the leisure class may enter the public high schools and State universities, and obtain an education leading directly or indirectly to vocational efficiency. Not everyone, however, seems to be conscious of the fact that the great masses who leave school at fourteen—either from choice or from necessity—to enter into vocational life are entitled to as careful consideration in our educational plans as their more fortunate brothers. As a matter of fact, this great ninety per cent need vocational training, and have as good a right to expect it at the hands of the public as their brothers who enter the so-called "higher vocations."

We contribute to the support of the public schools on the ground that they are necessary to the perpetuation of our free institutions. We urge that a certain minimum of instruction and training is indispensable as a preparation for citizenship, and that the training in character connected with the acquisition of the minimum is of great importance in this preparation. We are now beginning to see that we are permitting the boys and girls to leave our public schools at fourteen, just at the time when they most need guidance and instruction, just at the time when character-building really begins, and just when they should be objects of special attention in our educational plans. The State can not continue to expend vast sums of money in high schools and universities, and neglect the ninety per cent who now go into vocational life with only elementary school training, without repudiating the reasons usually

given for having schools of any sort as a public charge. If self-preservation through the training of the character of the future citizen is the justification for spending public money for schools, the State must enter the entire field of vocational education, and provide for all — the artisan, the professional man, the farmer, and the merchant. Justice to the individual as well as self-preservation of the State demands this.

It would be difficult to over-estimate the value of our system of elementary schools. The general education given in them is the necessary basis of all vocations — academic or industrial. While these schools are in need of improvement, and probably will in the future devote greater attention to the training of eye and hand, this training should be given on account of its pedagogical importance rather than of its vocational utility. The eight years of general training of the elementary school system should not be shortened to make room for any scheme of vocational training. Any attempt to substitute for this a training for mere skill and instruction concerning machinery and processes of production will be fully as apt to hinder as to further the development of the mental powers.

It is sometimes proposed to provide vocational training for the backward children in the elementary schools. While experience has shown that much can be done for these unfortunate children by the introduction of the manual arts, the introduction of pure vocational training may lead to the forming of false ideals in the minds of the pupils in the elementary school. It may lead to the assumption that general training is of little importance for the mechanic, and it is also quite apt to lead to the impression that manual labor — skilled or unskilled — is the proper employment of children of lesser ability, while the gifted may expect work in a profession. This ideal is undemocratic and foolish. It would be better to hold up the ideal that skilled manual labor is just as honorable as work in an office, and more profitable, and that it requires a much higher degree of

character and ability. In short, we should strive to check the rush of our youth away from the shop and the farm into the office.

Roughly speaking, the age of fourteen, the beginning of the age of adolescence, marks the end of this general training for nine-tenths of the boys and girls in civilized communities; it marks the end of the period of compulsory attendance, as provided in the laws of civilized countries. The problem of industrial education, therefore, is a problem of adolescence. We are only beginning to recognize our responsibilities to the adolescent, to recognize that he is entitled to our guidance and care, and that he needs it probably more than he has at any previous period of his life. He is at the parting of the ways; he is ceasing to be a child, but is not yet a man; he is beginning to be interested in matters related to his life work, in the problems of society, and of the State. More can now be done towards training his character than at any previous or subsequent period of his life. One of the blunders of civilized countries, a blunder that has led to an enormous increase in the number of youthful vagabonds and criminals, has been to neglect the adolescent, and to act as though there were a sharply defined line separating the child from the man, and that it is feasible and wise to care for the child systematically up to fourteen and then leave him abruptly and absolutely to the tender mercies of the factory and street.

If we are to undertake the further training of these boys, we must consider their newly awakened needs and interests; we must recollect that there is a limit to the amount of instruction along academic lines that they are ready to receive. If we attempt to keep them in a school of any kind, and repeat the sort of instruction they have been receiving during eight years of childhood, we shall disappoint a majority of them, and leave them bored, sullen, and obstinate. If we wish to hold them longer, we must arouse their interests by connecting the school with their vocation. Through this interest, we may hope to succeed in giving them

some all-round cultural training — training that will not only make them more efficient bread-winners, but better men and better citizens.

In attempting to meet the present-day demands upon our schools, the author would suggest the following considerations:

I. The changes in the industries due to the introduction of factory production with its minute division of labor brought about a decay of the apprenticeship system throughout the entire civilized world. Germany, Austria, and Switzerland have undertaken with considerable success to preserve apprenticeship, and to care for the industria- education of the youth by a combination of apprenticel ship and the continuation school. In England, France, and America the decay of the system has been accepted as a settled fact, and little or nothing has been done to revive it. There is, however, reason to believe that it is worth our while to revive and to reorganize the system of apprenticeship.

The State of Wisconsin has recently enacted a series of laws providing for the establishment of trade and continuation schools, as well as laws relating to apprenticeship and the labor of minors between the ages of fourteen and sixteen. Such legislation should be included in any plan for the industrial education of youth. A practical scheme for educating our youth should include both school work and practical work outside. Then, too, the principle ought to be definitely laid down by our laws that employers of youth between fourteen and eighteen must assume some responsibility for this education — both general and vocational.

II. The period of childhood — between the years of six and fourteen — should be preserved for general cultural education, with adequate attention to the training of eye and hand. This does not mean that all children in the eight grades shall do exactly the same work, either in quantity or in quality. We must recognize differences in the ability and interests of children in the elementary school; changes in the quantity of work prescribed for

different children and changes in the emphasis given to different portions of it should be a feature in the future elementary school. The cultural ideal, however, should be preserved up to the end of the elementary school period — the age of fourteen. No system of vocational schools should be instituted that will hurry boys and girls out of the elementary school into the vocational schools.

III. The most important feature in a plan of industrial education will be the organization of a system of vocational continuation schools which will demand from six to ten hours a week of the time of youth between the ages of fourteen and eighteen. The instruction must be day instruction, given in special schools, managed by specially trained teachers, a part of whom, at least, must be practical men from the industries. In such instruction the vocation will be the central point, and everything will be treated from the standpoint of its relation to this central topic. The subjects of instruction will not be treated as subjects, but in their relation to the vocation. General cultural aims will not be abandoned, but will grow out of the vocational work of the school. The subjects of instruction will include, for example, the mother-tongue, civics, and hygiene, as well as the drawing, mathematics, science, and technology required by the vocation itself. Such schools will, of course, be equipped with such laboratories and shops as are required in carrying out their plans. Such vocational continuation schools will provide for the instruction of both boys and girls in the mechanical trades, for commerce, and for agriculture, and courses of study, time of instruction, and methods of management will be modified to suit the needs of the classes to be served.

IV. A system of secondary vocational schools open to students from the vocations, even if they have not completed the elementary school course, is a necessary part of a plan for industrial education. Larger communities should establish independent schools of this character; others will be compelled to employ other agencies, such as departments of the ordinary secondary schools of the community.

The work in these schools or departments must be scientific and practical, the teachers generally being practical men from the vocations. Their purpose should be to afford opportunity for advancement to youth who do not have the academic preparation required by our secondary schools, but who have — what is perhaps as important — experience in a vocation, and an interest in advancing themselves in it.

Perhaps the most important function of such a secondary vocational school would be to keep up the standard of the vocational continuation schools in its community. Educational history has shown that each form of school requires stimulation and assistance from above, and the continuation school is no exception to this rule. Wherever you find a good system of vocational continuation schools in Europe, you will find them related to higher vocational instruction. Such higher vocational schools, in carrying out this purpose of stimulating and guiding the continuation schools, should conduct model continuation classes with the purpose of showing what a continuation school should do, and what a continuation school can do. With their especially equipped shops and class-rooms and their trained teachers, they can organize continuation classes that will serve as models for all the other continuation schools of the community.

Wherever there are schools like the Milwaukee Trade School, or industrial schools like Lewis Institute of Chicago, or schools managed and supported by corporations of business men or by unions of working men, such as the Union School for Painters of Chicago, they may be induced to establish continuation schools to serve as models for the public continuation schools, at least in the purely technical subjects. It is important to recognize and utilize such practical organizations if we hope to keep our vocational schools in touch with modern industrial conditions. It has required a constant fight to prevent academic ideals from destroying the usefulness of the industrial schools of Germany.

Another agency which is being used for this purpose in foreign countries, and to a lesser degree in America, is

the technical or art-trades museum. Such institutions offer unusual opportunities for providing model instruction in the technical and art trades, and the system of public continuation schools will be greatly benefited by co-operation with them.

V. A well-organized plan of connecting the elementary and continuation schools on the one hand, and the vocations on the other, through a bureau of vocational guidance, is an indispensable part of any plan of industrial education. Plans of this sort can be seen in operation in Boston, Edinburgh, Strassburg, Munich, and many other places. These bureaus usually have first-hand information about the industries of the community, and are in touch with chambers of commerce and trade, as well as with the school officials. Such bureaus form a clearing-house between the boys and girls seeking employment and the employers of labor. They are able to save time and energy on the part of both, and prevent the boys and girls from entering "blind-alley" jobs. They are able to prevent the employment of children by unscrupulous men who will teach them nothing, and who sometimes require them to work under unsanitary and unwholesome conditions. Such bureaus will prevent an enormous waste of human material in our great cities.

VI. Vocational schools must be administered by practical men from the vocations and educators. Without the practical men they will not keep in touch with actual life conditions; without the educators they will waste the time and strength of the pupils by ill-considered methods of instruction, and will be dominated too completely by the vocational aim. We require men and citizens as well as workmen, and we cannot secure them without the united effort of both the practical men and the educators.

We must also recollect that both general and technical education is important as a means of prevention of the waste of the human resources of society in its gifted men, born in lowly life and prevented from development on account of want of opportunity. As Mr. Marshall says: "There is no extravagance more prejudicial to the growth

of national wealth than that wasteful negligence which allows genius that happens to be born of lowly parentage to expend itself in lowly work." He points out that it is to the ability of the children of the working classes that we must ascribe the greater part of the success of the cities of the middle ages and of Scotland in recent times. While education cannot add to the supply of genius in art, in science, or in business, it can keep genius from running to waste.

Such a system of vocational schools as has been suggested will provide opportunities for both the genius and the ordinary man born in lowly life, and increase the general efficiency and comfort of the world. In justice we can do no less. We can become a true democracy only when our system of schools offers equal opportunities to all classes and all talents; when we shall be as much concerned about training a good blacksmith as we are about training a good lawyer; when "every man shall receive vocational training who would be better off with it than without it."

Finally, while we should never give over our ideal of training for general culture, we must not underestimate the educational significance of a man's work as a bread-winner; of the activity he displays in his vocation. Character is largely the result of habit, the result of the continued use of our faculties, of the feelings aroused by our activities, and by our relations to our fellows while engaged in work. Mr. Marshall, in his Economics, points out that "Man's character has been developed through all the ages by his daily work. Religious ideals and military and artistic spirit may at times be the most shaping influences, but man's daily work in securing his daily bread has never been displaced from its leading position for any great length of time." If men can be trained to perform their daily work efficiently, and, therefore, with satisfaction and joy, by a well-considered system of education which makes them more efficient and consequently better satisfied with themselves and the world, we shall take a long step towards the millennium.

## SECONDARY VOCATIONAL SCHOOLS IN PRUSSIA

| City | Province | Date of Foundation | Character of School | Length of Course, Semesters | Lowest Age of Admission, [b] Years |
|---|---|---|---|---|---|
| Hanau | Hesse-Nassau | 1772 | Royal Drawing Academy | 6 | 14 |
| Königsberg | East Prussia | 1790 | Royal Art and Industrial School | 6 | 14 |
| Magdeburg | Saxony | 1793 | Royal Art and Trade School | .. | .. |
| do | do | 1801 | Industrial Drawing School | .. | .. |
| Dansig | West Prussia | 1804 | Royal Art and Trade School | .. | .. |
| Nienburg | Hanover | 1853 | School for the Building Trades | 5 | 16 |
| Mülheim | Rhineland | 1854 | School of Weaving | .. | .. |
| Crefeld | do | 1855 | School for the Textile Industries | 6 | 16 |
| Einbeck | Hanover | 1861 | School of Weaving | .. | .. |
| Höxter | Westphalia | 1864 | Royal School for the Building Trades | 5 | 16 |
| Eckernförde | Schleswig-Holstein | 1868 | do | 5 | 16 |
| Idstein | Hesse-Nassau | 1869 | do | 5 | 16 |
| Cassel | do | 1869 | Industrial Art School and School of Design | 6 | 14 |
| Spremberg | Brandenburg | 1869 | School for the Textile Industries | 4 | 16 |
| Halle | Saxony | 1870 | Trade School | 6 | 14 |
| Cologne | Rhineland | 1870 | Industrial Drawing School | .. | .. |
| Rheydt | do | 1870 | Royal Commercial and Industrial School for Girls | [f] | 14–16 |
| Stettin | Pomerania | 1874 | Commercial and Industrial School for Girls | [f] | 14–16 |
| Elbing | West Prussia | 1874 | do | [f] | 14–16 |
| Elberfeld | Rhineland | 1875 | Industrial Drawing School | .. | .. |
| Heinsberg | do | 1876 | Basket and Furniture Braiding School | 1 | 16 |
| Deutsch Krone | West Prussia | 1877 | Royal School for the Building Trades | 5 | 16 |
| Breslau | Silesia | 1878 | do | 5 | 16 |
| Höhr | Hesse-Nassau | 1879 | School of the Ceramic Arts | 4 | 14 |
| Frankfurt | do | 1879 | School of Industrial Arts and Design | 6 | 16 |

[a] Though the term "Semester" means a half-year, it is in these schools generally meant for winter; hence a school of four semesters is really one of four winters or more than four half-years, many of these schools not being open during the summer. However, the practical work in shops and factories in summer only deepens the theoretical winter work.

[b] The age of admission is not always stated, but no student can be admitted who has not passed through the eight grades of the people's school, and hence is 14 years old. Schools requiring apprentice work admit students at 16.

[f] Differs in departments.

SECONDARY VOCATIONAL SCHOOLS IN PRUSSIA—*Continued*

| City | Province | Date of Foundation | Character of School | Length of Course, Semesters | Lowest Age of Admission, Years |
|---|---|---|---|---|---|
| Iserlohn | Westphalia | 1879 | Royal School for the Bronze Industry | 6 | 17 |
| Alten-Essen | Rhineland | 1879 | Industrial and Commercial School for Girls | *a* | 14–16 |
| Berlin | Brandenburg | 1880 | First City Trade School | 6 | 14 |
| Remscheidt | Rhineland | 1880 | Royal School for the Cutlery and other Steel Trades | 2–6 | 14 |
| Grävenwiesbach | Silesia | 1882 | Basket and Furniture Braiding School | 2 | 16 |
| Bochum | Westphalia | 1882 | School of Iron Smelting | .. | .. |
| Berlin | Brandenburg | 1883 | School for the Building Trades | 5 | 16 |
| Düsseldorf | Rhineland | 1883 | School of Industrial Arts and Design | 6 | 14 |
| Sorau | Brandenburg | 1886 | School for the Textile Industries | 6 | 16 |
| Berlin | do | 1866 | Schools of Domestic Science, Industry, and Commerce for Young Ladies (Lette-Verein) | *a* | 15–16 |
| do | do | 1872 | Home for Daughters of Higher Classes | *a* | 14 |
| Halle | Saxony | 1879 | City Commercial and Industrial School for Girls | *a* | 15–16 |
| Posen | Posen | 1881 | Royal Commercial and Industrial School for Girls | *a* | 14–16 |
| Berlin | Brandenburg | 1883 | School for the Textile Industries | 6 | 16 |
| Aachen | Rhineland | 1883 | do | 6 | 16 |
| do | do | 1886 | School of Industrial Art and Design | 6 | 14 |
| do | do | 1886 | Industrial Day School | 4 | 16 |
| Magdeburg | Saxony | 1887 | School of Industrial Arts and Trades | 6 | 14 |
| Lennep | Rhineland | 1887 | School of Women's Handwork | 4 | 16 |
| Nowawes | Brandenburg | 1888 | School of Weaving | .. | .. |
| Wiesbaden | Hesse-Nassau | 1888 | School of Industrial Arts and Domestic Science for Girls | *a* | 14–16 |
| Rummelsburg | Pomerania | 1889 | Apprentice School for Weavers | .. | .. |
| Frankfurt | Hesse-Nassau | 1889 | City School of Domestic Science for Girls | *a* | 14–16 |
| Buxtehude | Hanover | 1890 | Royal School for the Building Trades | 5 | 16 |
| Magdeburg | Saxony | 1890 | do | 5 | 16 |
| Hanover | Hanover | 1890 | School of Industrial Arts and Trades | 6 | 14 |
| Falkenburg | Pomerania | 1890 | School of Weaving | .. | .. |
| Forst | Brandenburg | 1890 | School for the Textile Industries | 6 | 16 |
| Sommerfeld | do | 1890 | do | 6 | 16 |
| Finsterwalde | do | 1890 | School of Weaving | .. | .. |
| Dortmund | Westphalia | 1890 | Royal School of Machine Building | 4 | 14 |

| | | | | | |
|---|---|---|---|---|---|
| Cologne-Nippes | Rhineland | 1890 | School of Domestic Science | 4 | 16 |
| Cottbus | Brandenburg | 1883 | School for the Textile Industries | 6 | 16 |
| Graudenz | West Prussia | 1883 | School of Industrial Arts and Domestic Science for Girls | a | 14–16 |
| Posen | Posen | 1891 | Royal School for the Building Trades | 5 | 16 |
| Magdeburg | Saxony | 1891 | Royal School of Machine Building | 4 | 14 |
| Duisburg | Rhineland | 1892 | Royal School of Machine Building and Smelting | 5 | 14 |
| Königsberg | East Prussia | 1893 | Royal School for the Building Trades | 5 | 16 |
| Görlitz | Silesia | 1894 | do | 5 | 16 |
| Cologne | Rhineland | 1878 | do | 5 | 16 |
| do | do | 1895 | Royal School of Machine Building | 4 | 14 |
| do | do | 1895 | School of Industrial Arts and Trades | 6 | 14 |
| Bunzlau | Silesia | 1897 | Royal School of Ceramic Arts | 4 | 14 |
| Hanover | Hanover | 1879 | School of Industrial Arts and Domestic Science for Girls | a | 14–16 |
| Danzig | West Prussia | 1880 | Commercial School for Young Ladies | 4 | 16 |
| Görlitz | Silesia | 1891 | School of Industrial Arts and Domestic Science for Girls | a | 14–16 |
| Laubau | do | 1894 | School of Ornamental Brick Making | 2 | 14 |
| Marienburg | West Prussia | 1894 | School of Industrial Arts and Domestic Science for Girls | a | 14–16 |
| Posen | Posen | 1894 | Industrial School for Deafmute Girls | 4 | 14 |
| Cassel | Hesse-Nassau | 1896 | Royal School for the Building Trades | 5 | 16 |
| Barmen | Rhineland | 1896 | School of Industrial Arts and Trades | 6 | 14 |
| Charlottenburg | Brandenburg | 1896 | do | 6 | 14 |
| Quedinburg | Saxony | 1896 | School of Industrial Arts and Design | 6 | 14 |
| Hagen | Westphalia | 1896 | Royal School of Machine Building | 4 | 14 |
| Gleiwitz | Silesia | 1896 | Royal School of Machine Building and Smelting | 5 | 14 |
| Elbing | West Prussia | 1896 | Higher Continuation School for Girls | a | 16 |
| Hohensalza | Posen | 1896 | Industrial and Commercial School | 6 | 14 |
| Düsseldorf | Rhineland | 1896 | City Commercial School for Girls | 4 | 16 |
| Barmen-Elberfeld | Rhineland | 1897 | Royal School for the Building Trades | 5 | 16 |
| Elberfeld | do | 1897 | School of Industrial Arts and Trades | 6 | 14 |
| Breslau | Silesia | 1897 | Royal School of Machine Building | 4 | 14 |
| Habelschwerdt | do | 1897 | School of Embroidery | 3 | 16 |
| Lewin | do | 1897 | do | 3 | 16 |
| Mittelwalde | do | 1897 | do | 3 | 16 |
| Neurode | do | 1897 | do | 3 | 16 |
| Reiners | do | 1897 | do | 3 | 16 |

a Differs in departments.

SECONDARY VOCATIONAL SCHOOLS IN PRUSSIA—*Continued*

| City | Province | Date of Foundation | Character of School | Length of Course, Semesters | Lowest Age of Admission, Years |
|---|---|---|---|---|---|
| Wünschelburg | do | 1897 | do | 3 | 16 |
| Schomberg | do | 1897 | do | 3 | 16 |
| Wiesbaden | Hesse-Nassau | 1897 | Industrial Society of Nassau; 4 Schools for Girls | 3 | 14–16 |
| Frankfurt | Brandenburg | 1898 | Royal School for the Building Trades | 5 | 16 |
| Münster | Westphalia | 1898 | do | 5 | 16 |
| Erfurt | Saxony | 1898 | School of Industrial Arts and Trades | 6 | 14 |
| Elberfeld | Rhineland | 1898 | Royal School of Machine Building | 4 | 14 |
| Altona | Schleswig-Holstein | 1898 | do | 4 | 14 |
| Görlitz | Silesia | 1898 | do | 4 | 14 |
| Mühlhausen | Saxony | 1898 | School for the Textile Industries | 4 | 16 |
| Kattowitz | Silesia | 1899 | Royal School for the Building Trades | 5 | 16 |
| Stettin | Pomerania | 1899 | do | 5 | 16 |
| Ronsdorf | Rhineland | 1899 | School for the Textile Industries | 4 | 16 |
| Aachen | do | 1900 | Royal School for the Building Trades | 5 | 16 |
| Hildesheim | Hanover | 1900 | do | 5 | 16 |
| Rehburg | do | 1900 | Technical School of Architecture | 4 | 16 |
| Altona | Schleswig-Holstein | 1900 | School of Industrial Arts and Trades | 6 | 14 |
| Essen | Rhineland | 1900 | Industrial School | .. | .. |
| Stettin | Pomerania | 1900 | Royal School of Machine Building | 4 | 14 |
| Barmen | Rhineland | 1900 | School for the Textile Industries | 4 | 16 |
| Langenlielau | Silesia | 1900 | do | 4 | 16 |
| Einbeck | Hanover | 1900 | Royal School of Machine Building | .. | .. |
| Siegen | Westphalia | 1900 | Royal School for Iron and Steel Industries | 4 | 16 |
| Munich Gladbach | Rhineland | 1901 | School for the Textile Industries | 4 | 16 |
| Breslau | Silesia | 1866 | Woman's Society; 3 Schools for Girls | *a* | 14–16 |
| Münster | Westphalia | 1876 | School of Industrial Arts and Trades | 4 | 14 |
| Berlin-Marienfelde | Brandenburg | 1881 | Domestic Science School (Continuation School) | *a c* | 14–16 |
| Potsdam | do | 1888 | Royal Commercial and Industrial School for Girls | 4 | 14–16 |
| Freiberg | Saxony | 1889 | School for the Tanning Trade | 3 | 16 |
| Königsberg | East Prussia | 1888 | School of Domestic Arts for Girls | *a* | 14–16 |

| | | | | | |
|---|---|---|---|---|---|
| do | do | 1900 | School of Domestic Science and Industry for Girls | *a* | 14–16 |
| do | do | 1890 | Continuation School of Domestic Science for Girls | *a* | 14–16 |
| Hanover | Hanover | 1890 | School of Domestic Arts for Girls | *a* | 14–16 |
| Cologne-Ehrenfeld | Rhineland | 1890 | do | *a* | 14–16 |
| Düsseldorf | do | 1891 | School of Embroidery and Design | 3 | 16 |
| Schwiebus | Brandenburg | 1894 | School for the Bookbinding Trade | 3 | 16 |
| Lennep | Rhineland | 1894 | School of Domestic Science and Cooking | *a* | 14–16 |
| Düsseldorf | do | 1895 | School for the Bookbinding Trade | 3 | 16 |
| Liegnitz | Silesia | 1897 | School of Domestic Science | *a* | 14–16 |
| Dortmund | Westphalia | 1898 | Industrial School for Young Ladies | *a* | 16 |
| Husum | Schleswig-Holstein | 1899 | Continuation School for Girls | 4 | 16 |
| Crefeld | Rhineland | 1899 | do | 4 | 16 |
| Flensburg | Schleswig-Holstein | 1900 | School of Industrial Arts and Design | 6 | 14 |
| Posen | Posen | 1900 | Royal School of Machine Building | 4 | 14 |
| Cologne | Rhineland | 1900 | Commercial College for Girls | 4 | 16 |
| Wetzlar | do | 1900 | Ambulatory School of Domestic Arts | 4 | 16 |
| Danzig-Langfuhr | West Prussia | 1900 | School of Industrial and Domestic Arts | *a* | 14–16 |
| Tilsit | East Prussia | 1900 | Industrial Continuation Schools for Girls | 4 | 16 |
| Erfurt | Saxony | 1901 | Royal School for the Building Trades | 5 | 16 |
| Danzig | West Prussia | 1901 | Commercial and Industrial School | 4 | 14–16 |
| Elbing | West Prussia | 1901 | Industrial School | 6 | 14 |
| Gnesen | Posen | 1901 | Commercial and Industrial School | 4 | 14–16 |
| Ziegenhals | Silesia | 1901 | School for the Glove Trade | 2 | 16 |
| Hildesheim | Hanover | 1901 | Trade School | 6 | 14 |
| Memel | East Prussia | 1901 | School of Domestic Arts | 4 | 16 |
| Nordhausen | Saxony | 1901 | Commercial and Industrial School for Girls | *a* | 14–16 |
| Warmbrunn | Silesia | 1902 | School of Wood Carving and Design | 3 | 16 |
| Aachen | Rhineland | 1902 | Royal School of Machine Building | 6 | 14 |
| Schmalkalden | Hesse-Nassau | 1902 | Royal School of Iron and Steel Trades | 4 | 14 |
| Göttingen | Hanover | 1902 | School of Domestic Science and Cooking | *a* | 14–16 |
| Kiel | Schleswig-Holstein | 1903 | Royal Shipbuilding and Machine Building School | 4 | 16 |

*a* Differs in departments.

*c* Wherever the words "Continuation School" are used in this list they are applied to an advanced kind, properly classed among the secondary vocational schools. See Domestic Science School (continuation school), city of Berlin-Marienfelde; Continuation School for Girls, cities of Husum, Crefeld, Lyck, Gummersbach, Wetter, and Suhl.

SECONDARY VOCATIONAL SCHOOLS IN PRUSSIA—*Continued*

| City | Province | Date of Foundation | Character of School | Length of Course, Semesters | Lowest Age of Admission, Years |
|---|---|---|---|---|---|
| Breslau | Silesia | 1903 | Trade School | 6 | 14–16 |
| Hersfeld | Hesse-Nassau | 1903 | School of Domestic Science and Cooking | *a* | 14 |
| Eschwege | do | 1903 | School of Domestic Science | 4 | 16 |
| Schmalkalden | do | 1903 | do | 4 | 16 |
| Lyck | East Prussia | 1903 | Continuation School for Girls | 6 | 14 |
| Luckenwalde | Brandenburg | 1903 | Dressmaking School | 4 | 14 |
| Crefeld | Rhineland | 1904 | School of Industrial Arts and Trades | 6 | 14 |
| Dortmund | Westphalia | 1904 | Trade School | 6 | 14 |
| Solingen | Rhineland | 1904 | School for the Cutlery and Small Ironware Trades | 4 | 14 |
| Haynau | Silesia | 1904 | School for the Glove Trade | 3 | 15 |
| Wermelskirchen | Rhineland | 1904 | School for the Shoe and Boot Making Trade | 4 | 16 |
| Trier (Treves) | do | 1904 | School of Industrial Arts and Trades | 6 | 14 |
| Berlin | Brandenburg | 1904 | School for the Bookbinding Trade | 3 | 16 |
| Falkenburg | Pomerania | 1904 | School of Industrial Arts and Domestic Science | *a* | 14–16 |
| Zeitz | Saxony | 1904 | Continuation School for Girls | *a* | 14 |
| Briesen | West Prussia | 1904 | School of Domestic Science | *a* | 14 |
| Einbeck | Hanover | 1904 | School of Industrial Arts and Domestic Science | *a* | 14–16 |
| Halberstadt | Saxony | 1905 | School for the Glove Trade | 3 | 15 |
| Eupen | Rhineland | 1905 | School of Industry and Commerce | 6 | 14 |
| Kolmar | Pomerania | 1905 | School of Domestic Science | 4 | 16 |
| Gummersbach | Rhineland | 1900 | Continuation School for Girls | 4 | 14 |
| Erfurt | Saxony | 1904 | Continuation School of Domestic Science | 4 | 14 |
| Hagen | Westphalia | 1904 | School of Domestic Science | 4 | 16 |
| Rendsburg | Schleswig-Holstein | 1905 | School of Architecture (Tiefbau) | 5 | 16 |
| Beuthen | Silesia | 1905 | Vocational Classes of Industrial Continuation School | 4 | 14 |
| Kattowitz | do | 1905 | do | 4 | 14 |
| Kiel | Schleswig-Holstein | 1905 | Trade School | 6 | 14 |
| Mayen | Rhineland | 1905 | Commercial School for Girls | 4 | 16 |
| Thorn | West Prussia | 1906 | Royal School of Industrial Arts | 6 | 14 |
| Göttingen | Hanover | 1906 | School for Mechanicians | 6 | 14 |
| Nienburg | do | 1906 | Industrial and Commercial School for Girls | 4 | 14–16 |
| Oppeln | Silesia | 1906 | Commercial School for Girls | 4 | 16 |

| | | | | | |
|---|---|---|---|---|---|
| Königshütte | do | 1906 | do | 4 | 16 |
| Beuthen | do | 1906 | do | 4 | 16 |
| Kulm | West Prussia | 1906 | School of Domestic Science | 4 | 14 |
| Gleiwitz | Silesia | 1906 | Commercial School for Girls | 4 | 16 |
| Spandau | Brandenburg | 1906 | School for Domestic Science and Cooking | a | 14–16 |
| Bielefeld | Westphalia | 1907 | Trade School | 4 | 14 |
| Graudenz | West Prussia | 1907 | School of Machine Building | 4 | 14 |
| Berlin | Brandenburg | 1907 | School of Soap Making | 3 | 15 |
| Mittelwalde | do | 1907 | School of Industrial Arts | 6 | 14 |
| Habelschwerdt | Silesia | 1907 | do | 6 | 14 |
| Apenrade | Schleswig-Holstein | 1907 | Courses in Domestic Science | a | 16 |
| Neisse | Silesia | 1907 | Commercial School for Girls | 4 | 14 |
| Wetter | Hesse-Nassau | 1907 | Continuation School of Domestic Science | 4 | 14 |
| Frankfurt | do | 1908 | Royal School for the Building Trades | 5 | 16 |
| Essen | Rhineland | 1908 | do | 5 | 16 |
| do | do | 1908 | School of Machine Building | 4 | 14 |
| Nauen | Brandenburg | 1908 | School of Domestic Science | 4 | 16 |
| Suhl | Saxony | 1908 | Continuation School for Girls | 4 | 14 |
| Oberlahnstein | Rhineland | 1908 | Cooking School | 4 | 16 |
| Dortmund | Westphalia | 1908 | Continuation Courses of Domestic Science | 4 | 14 |
| Schneidemühl | Posen | 1909 | School of Industrial and Domestic Arts | a | 14–16 |
| Düsseldorf | Rhineland | 1909 | Trade School | 6 | 14 |
| Stettin | Pomerania | 1909 | School of Industrial Arts | 6 | 14 |
| Nordhausen | Saxony | 1909 | School of Domestic Science | 4 | 16 |

a Differs in departments.

NOTE. The navigation schools, 35 in number, are omitted from the list of the Central Office; also the full, as well as the brief, courses for trade masters and shop or factory owners. The schools of mining, 53 in number, are also omitted, as not belonging to this department. The commercial schools for boys, 381 in number, are all classed among the continuation schools unless they are of a higher order, and are then classed among the colleges.

This table was taken from the third report of the Royal Prussia National Industrial Education Commission, as reprinted in the report of the United States Bureau of Education for 1910.

## HIGHER EDUCATIONAL INSTITUTIONS OF GERMANY

Numbers Attending the Universities in Winter Semester of 1909–10.

1. UNIVERSITIES

| Universities, etc. | I. Total Number of Students | | II. Students Authorised to Attend Lectures | | I. and II. Total Number of Regular and Irregular Students | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| 1. Berlin | 9,242 | 632 | 4,754 | 356 | 13,996 | 988 |
| 1a. Kaiser Wilhelm's Academy, Army Surgery | 402 | ... | ... | ... | 402 | ... |
| 2. Bonn | 3,652 | 135 | 272 | 111 | 3,924 | 246 |
| 3. Breslau | 2,405 | 84 | 388 | 195 | 2,793 | 279 |
| 4. Göttingen | 2,230 | 160 | 112 | 57 | 2,342 | 217 |
| 5. Greifswald | 881 | 49 | 96 | 50 | 977 | 99 |
| 6. Halle | 2,393 | 27 | 267 | 88 | 2,660 | 115 |
| 7. Kiel | 1,290 | 18 | 91 | 46 | 1,381 | 64 |
| 8. Königsberg | 1,367 | 46 | 199 | 107 | 1,566 | 153 |
| 9. Marburg | 1,878 | 38 | 45 | 31 | 1,923 | 69 |
| 10. Münster | 1,906 | 47 | 148 | 41 | 2,054 | 88 |
| 11. Braunsberg, Lyceum | 47 | ... | 16 | 7 | 58 | 7 |
| 12. Posen, Academy | ... | ... | 928 | 348 | 928 | 348 |
| 13. Munich | 6,537 | 183 | 543 | 191 | 7,080 | 374 |
| 14. Würzburg | 1,424 | 10 | 135 | ... | 1,559 | 10 |
| 15. Erlangen | 1,121 | 19 | 59 | 22 | 1,180 | 41 |
| 16. Leipsic | 4,761 | 59 | 869 | 114 | 5,630 | 173 |
| 17. Tübingen | 1,760 | 23 | 143 | 68 | 1,903 | 91 |
| 18 Heidelberg | 1,934 | 142 | 148 | 50 | 2,082 | 192 |
| 19. Freiburg | 2,167 | 86 | 138 | 47 | 2,305 | 133 |
| 20. Giessen | 1,261 | 57 | 157 | 64 | 1,418 | 101 |
| 21. Jena | 1,496 | 24 | 104 | 48 | 1,600 | 72 |
| 22 Rostock | 707 | 3 | 63 | 36 | 770 | 39 |
| 23. Strassburg | 1,995 | ... | 188 | 122 | 2,183 | 122 |
| Total | 52,851 | 1,822 | 9,863 | 2,199 | 62,714 | 4,021 |

Number Attending the Technical Universities in Winter Semester of 1909–10.

2. TECHNICAL UNIVERSITIES

| Technical Universities | Students Enrolled | | | | | | Total Number of Students | |
|---|---|---|---|---|---|---|---|---|
| | Regular | | Irregular | | Guests | | Regular and Irregular | Guests |
| | Men | Women | Men | Women | Men | Women | | |
| 1. Aachen | 571 | .. | 115 | .. | 162 | .. | 848 | .. |
| 2. Berlin | 2,120 | .. | 256 | 1 | 572 | 43 | 2,948 | 44 |
| 3. Brunswick | 427 | 2 | 69 | 1 | 251 | 190 | 747 | 193 |
| 4. Danzig | 647 | 2 | 78 | .. | 587 | 385 | 1,312 | 387 |
| 5. Darmstadt | 1,245 | 4 | 148 | .. | 219 | 113 | 1,612 | 117 |
| 6. Dresden | 892 | 3 | 138 | 4 | 350 | 204 | 1,380 | 211 |
| 7. Hannover | 879 | .. | 107 | .. | 650 | 420 | 1,636 | 420 |
| 8. Karlsruhe | 1,220 | 4 | 62 | .. | 109 | 57 | 1,391 | 61 |
| 9. Munich | 2,353 | 2 | 256 | .. | 301 | 18 | 2,910 | 20 |
| 10. Stuttgart | 874 | 3 | 414 | 282 | .. | .. | 1,288 | 285 |
| Total | 11,228 | 20 | 1,643 | 288 | 3,201 | 1,430 | 16,072 | 1,758 |

3. Mining Academies

| Academies | Students Attending in Winter Semester of 1909-10 | | | | | |
|---|---|---|---|---|---|---|
| | Regular | Irregular | Guests | | Total | |
| | | | Men | Women | Men | Women |
| Berlin | 153 | 20 | 63 | .. | 236 | .. |
| Clausthal | 85 | 15 | 5 | .. | 105 | .. |
| Freiberg | 415 | 32 | .. | .. | 447 | .. |
| Total | 653 | 67 | 68 | .. | 788 | .. |

4. Forestry Academies

| Academy or College | Students Attending in Winter Semester of 1909-10 | | | |
|---|---|---|---|---|
| | Regular | Irregular | Guests | Total |
| Eberswalde | 60 | 3 | .. | 63 |
| Munden | 67 | 4 | .. | 71 |
| Aschaffenburg | 30 | 21 | .. | 51 |
| Tharandt | 48 | 30 | 12 | 90 |
| Eisenach | 65 | 2 | .. | 67 |
| Total | 270 | 60 | 12 | 342 |

5. Agricultural Colleges

| Academy or College | Students Attending in Winter Semester of 1909-10 | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | Irregular | Guests | Total | |
| | Men | Women | | | Men | Women |
| Berlin | 668 | 2 | 192 | 52 | 912 | 2 |
| Bonn-Poppelsdorf | 548 | .. | 32 | .. | 580 | .. |
| Weihenstephan-Mnuich | 184 | .. | 10 | .. | 194 | .. |
| Hohenheim | 175 | .. | ... | .. | 175 | .. |
| Total | 1,575 | 2 | 234 | 52 | 1,861 | 2 |

There were also 115 men studying agriculture in the various German universities.

6. Veterinary Colleges

| College | Students Attending in Winter Semester of 1909-10 | | | |
|---|---|---|---|---|
| | Regular | Irregular | Guests | Total |
| Berlin | 370 | ... | 8 | 378 |
| Hannover | 227 | 11 | .. | 238 |
| Munich | 276 | 66 | .. | 342 |
| Dresden | 174 | 47 | 27 | 248 |
| Stuttgart | 106 | ... | .. | 106 |
| Total | 1,153 | 124 | 35 | 1,312 |

7. Commercial Colleges

| High School or Academy | Students Attending in Winter Semester of 1909-10 | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | Irregular | | Total | |
| | Men | Women | Men | Women | Men | Women |
| Berlin | 419 | 9 | 1,489 | 136 | 1,908 | 145 |
| Cologne | 458 | 14 | 1,871 | 75 | 2,329 | 89 |
| Frankfurt a. M. | 348 | 35 | 1,345 | 569 | 1,693 | 604 |
| Leipzig | 509 | 1 | 110 | ... | 619 | ... |
| Total | 1,734 | 59 | 4,815 | 780 | 6,549 | 839 |

There were also 364 men and 15 women studying Finance in the various German universities.

8. High Schools and Similar Public Educational Institutions for Plastic Arts

| Character | Students Attending in Winter Semester of 1909-10 | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | Irregular | | Total | |
| | Men | Women | Men | Women | Men | Women |
| 1. Royal Academic High School for the Plastic Arts, Berlin-Charlottenburg | 179 | .. | 34 | .. | 213 | .. |
| 2. 8 Academic Masters' Studio, Berlin-Charlottenburg | 35 | .. | .. | .. | 35 | .. |
| 3. Royal Art School, Berlin | 142 | 76 | 70 | 46 | 212 | 122 |
| 4. Educational Institution, Royal Art Trade Museum, Berlin | 345 | 68 | .. | .. | 345 | 68 |
| 5. Royal Art Academy, Königsberg, Prussia | 62 | 25 | .. | .. | 62 | 25 |
| 6. Royal Art School, Breslau | 138 | 37 | 81 | 26 | 219 | 63 |
| 7. Royal Academy for Plastic Arts, Cassel | .... | ... | ... | ... | .... | ... |
| 8. Royal Drawing Academy, Hanau | 185 | 22 | 17 | 10 | 202 | 32 |
| 9. Art School Frankfurt a. M. | 43 | 11 | ... | ... | 43 | 11 |
| 10. Royal Art Academy, Düsseldorf | 178 | ... | ... | ... | 178 | ... |
| 11. Royal Academy for Plastic Arts, Munich | 545 | ... | ... | ... | 545 | ... |
| 12. Royal Academy for Plastic Arts, Dresden | 227 | ... | ... | ... | 227 | ... |
| 13. Royal Academy for Graphic Arts and the Book Industry, Leipzig | 324 | 28 | 108 | 50 | 432 | 78 |
| 14. Royal Academy for Plastic Arts, Stuttgart | 105 | 4 | 7 | ... | 112 | 4 |
| 15. Grand-Ducal Academy for Plastic Arts, Karlsruhe | 111 | ... | ... | ... | 111 | ... |
| 16. Grand-Ducal Art School, Weimar | 116 | 46 | 66 | 61 | 182 | 107 |
| Total | 2,735 | 317 | 383 | 193 | 3,118 | 510 |

9. High Schools and Similar Public Educational Institutions for Music

| Character | Students Attending in Winter Semester of 1909-10 | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | Irregular | | Total | |
| | Men | Women | Men | Women | Men | Women |
| 1. Royal Academic High School for Music, Berlin-Charlottenburg. | 323 | 131 | .... | ... | 323 | 131 |
| 2. Academic Master School for Musical Composition, Berlin-Charlottenburg..... | 26 | 1 | .... | ... | 26 | 1 |
| 3. Royal Academic Institution for Church Music, Berlin-Charlottenburg..... | 29 | .... | .... | ... | 29 | .... |
| 4. Royal Academic Institution for Church Music, Breslau..... | .... | .... | .... | ... | .... | .... |
| 5. Royal Academy of Music, Munich..... | 371 | 168 | 9 | 9 | 380 | 177 |
| 6. Royal Music School, Würzburg. | 291 | 141 | 684 | 22 | 975 | 163 |
| 7. Royal Conservatory for Music and Theatre, Dresden..... | 1,183 | 728 | .... | ... | 1,183 | 728 |
| 8. Royal Conservatory of Music, Leipzig..... | 663 | 357 | .... | .... | 663 | 357 |
| 9. Royal Conservatory for Music, Stuttgart..... | 576 | 382 | .... | .... | 576 | 382 |
| 10. Grand-Ducal Conservatory of Music, Karlsruhe..... | 543 | 350 | 315 | 270 | 858 | 620 |
| 11. Grand-Ducal Music School, Weimar..... | 166 | 102 | .... | .... | 166 | 102 |
| 12. Royal Conservatory of Music, Sondershausen..... | 112 | 48 | .... | .... | 112 | 48 |
| Total..... | 4,283 | 2,408 | 1,008 | 301 | 5,291 | 2,709 |

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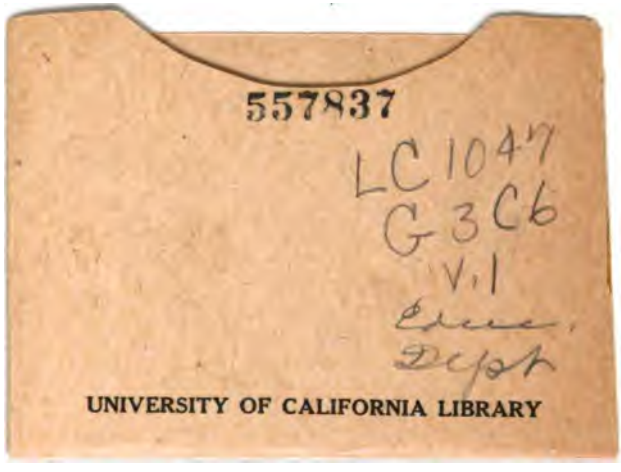
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